Fortress



The Atlantic Wall (1)

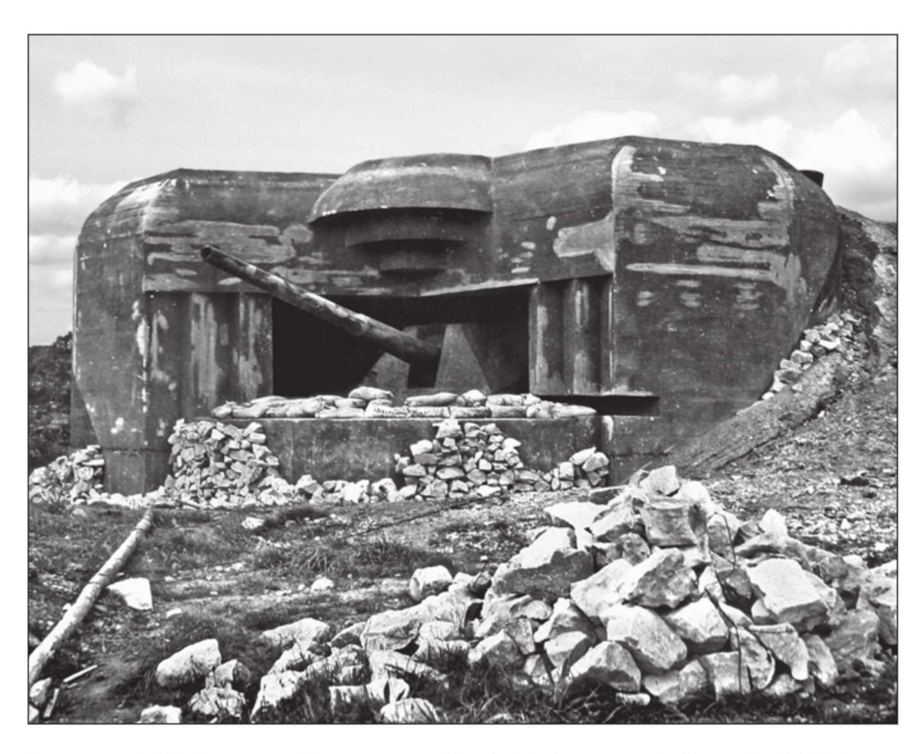
France

Steven J Zaloga • Illustrated by H Johnson, L Ray & C Taylor

Fortress • 63

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Series editors Marcus Cowper and Nikolai Bogdanovic

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Front cover: Canadian officers of the North Shore Regiment stand before one of the massive 406mm guns of the 5.Batterie, MAA.244, near Sangatte on the Pas-de-Calais after the capture of Batterie Lindemann in 1944. (National Archives Canada PA-133140 Donald I. Grant)

Author's note

The author would like to thank Joe Kaufmann for help in locating some of the bunkers photographed for this book. Thanks also go to the staffs of the US Army's Military History Institute (MHI) at the Army War College at Carlisle Barracks, PA, the US National Archives And Records Administration (NARA) in College Park, MD, and the National Archives of Canada in Ottawa (NAC).
For brevity, the usual conventions have been used when referring to German units. For example, 2/GR.726 refers to 2.Kompanie, Grenadier Regiment 726; 3/HKAA 1261 indicates 3.Batterie, Heeres-Küsten-Artillerie Abteilung 1261.

Glossary

AOK: *Armee Oberkommando,* army headquarters
Bauform: construction plan
EB: *Eisenbahnbatterie*: railroad battery
Festung: fortress
GR: grenadier regiment
HKAA: *Heeres-Küsten-Artillerie-Abteilung*, army coastal artillery regiment
IR: infantry regiment
MAA: *Marine-Artillerie-Abteilung*: navy artillery regiment
MKB: *Marine Küsten Batterie*: navy coastal battery
OB: *Offene Bettung*; open platform
Regelbau: construction standard, sometimes abbreviated as R when used with a particular plan, for example R621.
SK: *Sonderkonstruktion*: special design, not *Regelbau*
StP: *Stützpunkt*, strongpoint (company-sized)
Tobruk: A class of small bunkers with circular openings for a crew-served weapon
Tonne: Metric ton (1,000kg; 2.204lb)
Vf: *Verstarkfeldmässig*; reinforced field position such as a tobruk
Westwall: German fortifications created in the late 1930s on the French–German border, also known as Siegfried line
WN: *Wiederstandnest*, strongpoint (platoon-sized); sometimes abbreviated as "W" in the 709th Infantry Division sector

The Fortress Study Group (FSG)

The object of the FSG is to advance the education of the public in the study of all aspects of fortifications and their armaments, especially works constructed to mount or resist artillery. The FSG holds an annual conference in September over a long weekend with visits and evening lectures, an annual tour abroad lasting about eight days, and an annual Members' Day.
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The Coast Defense Study Group (CDSG)

The Coast Defense Study Group (CDSG) is a non-profit corporation formed to promote the study of coast defenses and fortifications, primarily but not exclusively those of the United States of America; their history, architecture, technology, and strategic and tactical employment. Membership in the CDSG includes four issues of the organization's two quarterly publications, the *Coast Defense Journal* and the *CDSG Newsletter.*
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Contents

Introduction

The Atlantic Wall was the largest fortification effort in recent European history, rivaled only by France's Maginot Line. The portions in France consumed over 17,000,000m^3 of concrete, 1,200,000 tonnes of steel and cost some 3.7 billion Deutschmarks. To put this in some perspective, the steel consumption was about five percent of German annual production and roughly equivalent to the amount used in annual German tank production.

If the Atlantic Wall had been carefully designed and skillfully integrated into Germany's strategic planning, it might have been worth its considerable cost. But it was created on Hitler's whim, built in haste with little coordinated planning, and fitted uncomfortably with the Wehrmacht's tactical doctrine. Hitler ordered its construction in response to British raiding along the English Channel and as a barrier to an anticipated Allied invasion. Wehrmacht commanders had little influence on this scheme, and a debate raged until D-Day over the best way to resist the inevitable Allied amphibious assault. The overstretched German war economy was unable to match Hitler's dream of "Fortress Europe," and the Atlantic Wall was never fully completed. The Wehrmacht commander in France, Generalfeld-marschall Gerd von Rundstedt, later derided the Atlantic Wall as an enormous propaganda bluff.

On D-Day, the Atlantic Wall was strongest where the Germans expected the Allied invasion, the "Iron Coast" of the Pas-de-Calais opposite Britain. The Allies wisely chose to avoid this heavily defended area and struck instead where the Atlantic Wall was weaker in lower Normandy. The D-Day assault overcame the Atlantic Wall in less than a day. Other stretches of the Atlantic Wall, especially near the Channel ports, were involved in later fighting but proved no more effective.



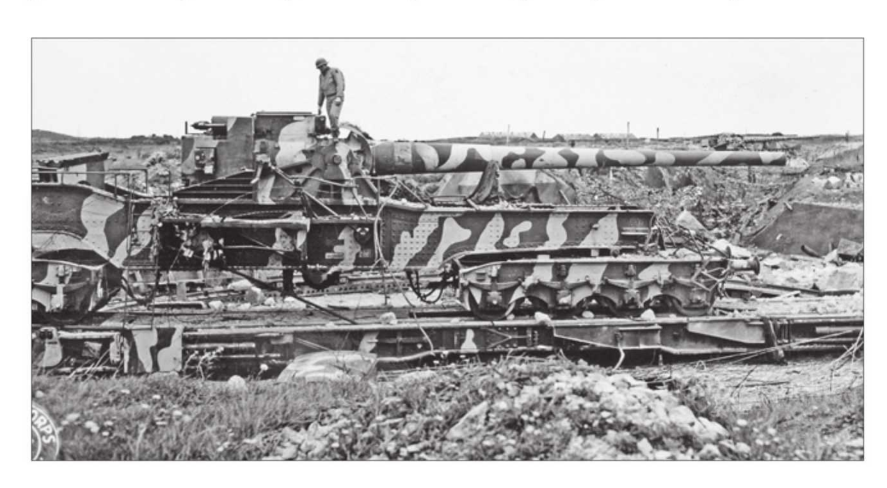
The ultimate role of the Atlantic Wall was to stop the Allied amphibious invasion: a mission that failed. This is a view from the H677 88mm PaK 43/41 gun casemate of strongpoint WN29 on Juno Beach near Courselles-sur-Mer on D-Day looking out on landing craft of the 3rd Canadian Infantry Division. (NAC PA-128792 Donald Grant)

Design and development

Coastal defense had been assigned to the Kriegsmarine (navy) since the reforms of Kaiser Wilhelm in the late 1880s. This mission focused on the defense of Germany's ports along the North Sea and Baltic coasts. By the time of World War I, German naval doctrine saw coastal defense as a series of layers beginning with warships and submarines at sea as the initial barrier, followed by coastal forces such as torpedo boats and small submarines as the inner layer, and finally fixed defenses such as minefields and shore batteries as the final defensive layer. Fortification played a minor role in this doctrine. During World War I, this doctrine was found inadequate when Germany occupied Belgium. The Kriegsmarine did not have the manpower or resources to create an adequate defense along the coast of Flanders, and the dominance of the Royal Navy in the English Channel undermined the traditional tactics since German warships stood little chance of challenging the British on a day-to-day basis. The Kriegsmarine was obliged to turn to the army to assist in this mission, particularly in the creation of gun batteries along the coast to discourage British raiding or possible amphibious attack. These gun batteries were employed in elementary *Kesselbettungen* (kettle positions) so named for the pan-like shape of the fortification. The Kreigsmarine began to pay more attention to needs of fortification in the late 1930s after Germany's re-militarization under Hitler's new Nazi government. One of the first major coastal fortification efforts took place on the islands in the Helgoland Bay, along the North Sea coast.

At the start of World War II, the Kriegsmarine retained the traditional coastal defense mission. There was no dedicated coastal defense force, but rather the mission was simply one of those assigned to the regional naval commands. The North Sea coast was defended with a scattering of coastal batteries and newly installed naval flak units, but there was little modern fortification construction prior to 1939. Following the defeat of France in the summer of 1940, the Wehrmacht began preparations for an amphibious assault on Britain, Operation *Seelöwe* (*Sealion*). On July 16, 1940, Hitler issued Führer Directive No. 16, which called for the creation of fortified coastal batteries on the Pas-de-Calais to command the Straits of Dover and to protect the forward staging areas of the German invasion fleet.

Since it would take time to erect major gun batteries, the first heavy artillery in place were army railroad guns that began arriving in August 1940. To provide these



The army preferred heavy railroad guns over massive fixed guns for long-range firepower. This is a Krupp 203mm K(E) of battery EB.685 stationed near Auderville-Laye in the Cherbourg sector shortly after its capture in June 1944. (NARA)

OPPOSITE **280mm K5E Railroad Gun *Dombunker***
Among the first type of fortifications built along the French coast was the *Dombunker* (cathedral bunker) so-called because of its resemblance to the arched shape of Gothic cathedrals. These were intended to protect three batteries of 280mm K5E railroad gun deployed to the Pas-de-Calais in the summer of 1940 and construction began in September 1940. This bunker was a simple reinforced tunnel, usually 80m in length and about 10m tall, though some bunkers such as the one at Hydrequent were shorter. Sites with these bunkers included Pointe aux Oies (EB.712), Fort Nieulay near Calais (EB.765), and Hydrequent (EB.713). Besides these bunkers, many of the railroad gun sites also were fitted with Vögele turntables to permit traverse of the weapon. (Artwork by Lee Ray)



The heights of Mont de Coupole, located to the southeast of Wissant, provided an ideal observation point between Cap Gris-Nez and Cap Blanc-Nez for the heavy artillery batteries nearby. As a result, the hilltop is dotted with observation bunkers like this one. (Author's collection)

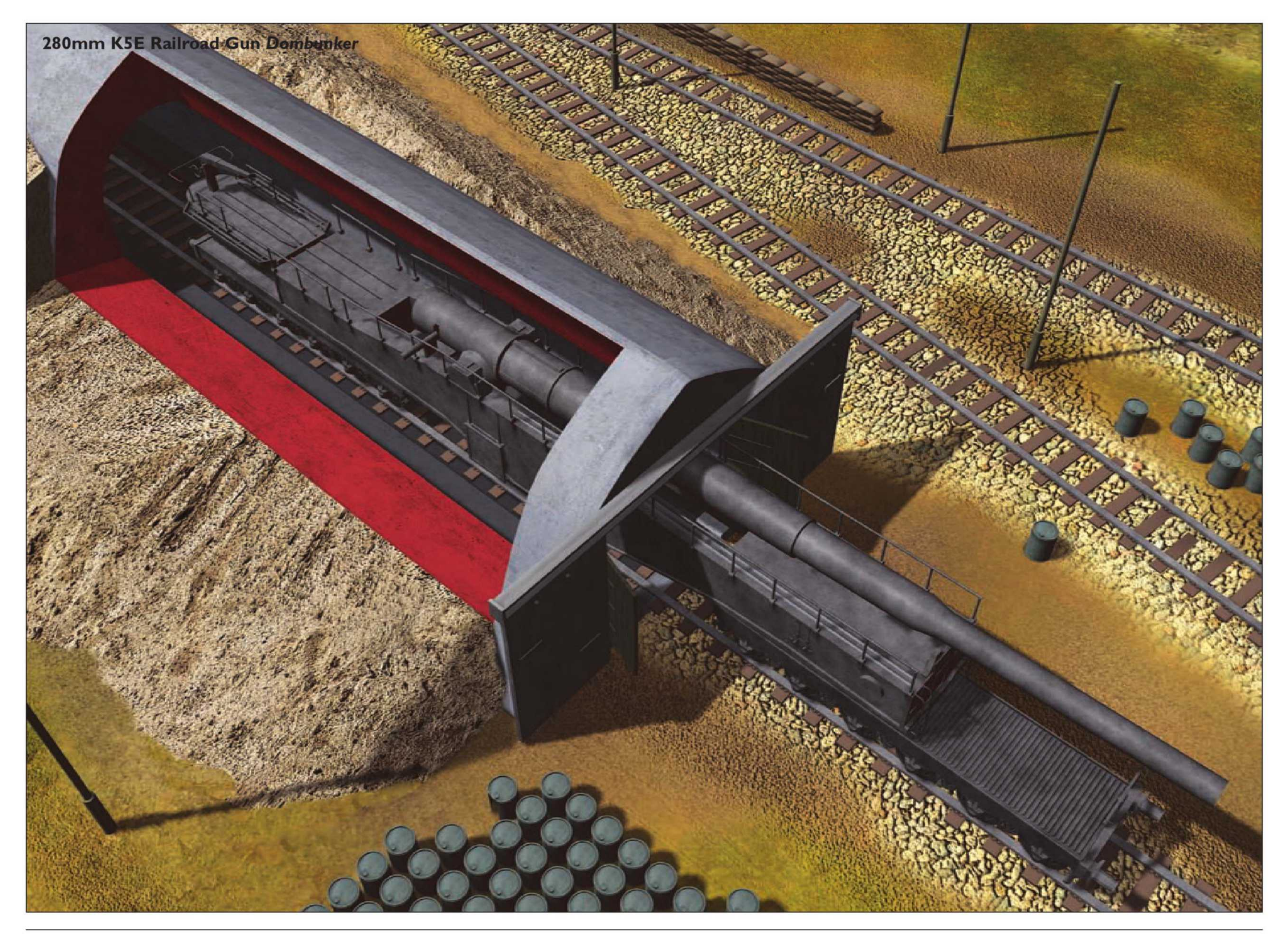
with a measure of protection against British air attack, several cathedral bunkers (*Dombunker*) were created near the coast at Calais, Vallée Heureuse, Marquise and Wimereux. At the time, the army had nine railroad artillery regiments with a total of 16 batteries and the Kriegsmarine had a pair of 150mm railroad guns known as Batterie Gneisenau. The army created a coastal artillery command to manage this new mission and the army artillery along the English Channel was put under the command of Army Artillery Command 104. There was some dispute between the army and Kriegsmarine over the direction of the coastal artillery, with an eventual compromise being reached that the navy would direct fire against naval targets while the army would direct fire against land targets and take over control once the invasion of Britain began.

Following the arrival of the railroad guns, both the army and Kriegsmarine began to move other types of heavy artillery to the Pas-de-Calais. The Kriegsmarine obtained some of these by stripping existing coastal fortifications, while the army obtained some weapons from the Westwall border fortifications or from field army heavy artillery regiments. Four powerful batteries were constructed, starting in 1941, which had the range to actually reach Britain near Dover and Folkestone. These included the Lindemann, Todt, Friedrich August and Grosser Kurfürst batteries. The artillery concentration in the Pas-de-Calais pre-dated the Atlantic Wall and was in reality an offensive deployment intended to support the invasion, and not a defensive fortified position. Even though not a true part of the Atlantic Wall, these batteries would come to symbolize Fortress Europe due to their frequent appearance in propaganda films.

The role of the Pas-de-Calais artillery batteries gradually evolved due to changing German war plans. As the possibilities for Operation *Seelöwe* dimmed in the winter of 1940, the role of the batteries gradually shifted to the naval interdiction role, challenging British shipping in the Channel. The railroad guns were gradually removed, especially once Hitler shifted his attention to Operation *Barbarossa*, the invasion of Russia scheduled for the summer of 1941. Construction

German Army railroad artillery batteries in France

Battery	Sector	Weapons
EB.688	Coquelles	2 x 280mm
EB.696	Saint-Pol	2 x 280mm
EB.710	Nieulay	2 x 280mm
EB.765	Frethun	2 x 280mm
EB.701	Hydrequent	1 x 210mm
EB.712	Pointe aux Oies	2 x 280mm
EB.713	Hydrequent	3 x 280mm
EB.655	Montreuil	4 x 150mm
EB.532	Paimpol	2 x 203mm
EB.721	Le Verdon	2 x 280mm
EB.664	Guethary	2 x 240mm
EB.674	Mondeguy	3 x 240mm



280mm K5E Railroad Gun *Dombunker*

A good example of a kettle gun emplacement typical of the initial construction in 1940–42, still part of the Cherbourg defenses in June 1944. The gun is a Saint-Chamond 155mm K220(f), a French World War I type widely used in the Atlantic Wall defenses. Most but not all of the kettle emplacements were rebuilt with full casemates by 1944. (NARA)



of some of the large gun batteries initiated in the summer of 1940 continued, but without any particular priority and most of the larger Pas-de-Calais batteries were not completed until well into 1942. The only area to receive special attention was the Channel Islands, which attracted Hitler's personal interest. He wanted the islands to be heavily defended to prevent their recapture by Britain and, in October 1941, authorized the heavy fortification of the islands as a key element to this process.

Coastal defense began to attract the attention of the Wehrmacht's occupation forces in France due to Britain's initiation of Commando raids along the Norwegian and French coasts. In February 1941, the army began proposing a policy directive which argued that a unified defense of the coast be established, with the army rather than the navy taking the lead role. This attempt was rebuffed by the OKW (Wehrmacht high command). which left the navy in charge of coastal defense artillery and the Luftwaffe in charge of flak protection of the coast, including naval flak batteries. Until the invasion of the Soviet Union in June 1941, there was a general policy against extensive fortification of the French coast for fear that it would confirm that the Wehrmacht's intention had shifted from the invasion of Britain to the invasion of Russia.

British Commandos staged attacks against the Lofoten Islands off the northern Norwegian coast in March and December 1941. These prompted another Führer directive on December 14, 1941, which ordered the construction of a "new Westwall." This order recognized that the western front was seriously short of troops due to the war in Russia, and it was proposed to substitute fortification for manpower. Light fortifications were authorized along endangered coastlines and permanent strongpoints at key points. Priority was given to the Norwegian coast, which Hitler felt was more vulnerable to such raids. Second priority went to the French coast, followed by the Dutch coast and Helgoland Bay in that order. Hitler also ordered the reinforcement of the coast defense with flak batteries that were assigned the dual role of anti-aircraft defense and potential use against landing craft. As a consequence of this order, the commander-in-chief West (OB West), Generalfeld-marschall Erwin von Witzleben, began to designate some of the key French ports as fortified areas (*Festungsbereichen*) to assign priorities for the eventual fortification effort. The Kriegsmarine was primarily responsible for the defense of the port itself, but the army was assigned the task of ensuring landward defense against possible airborne attacks.

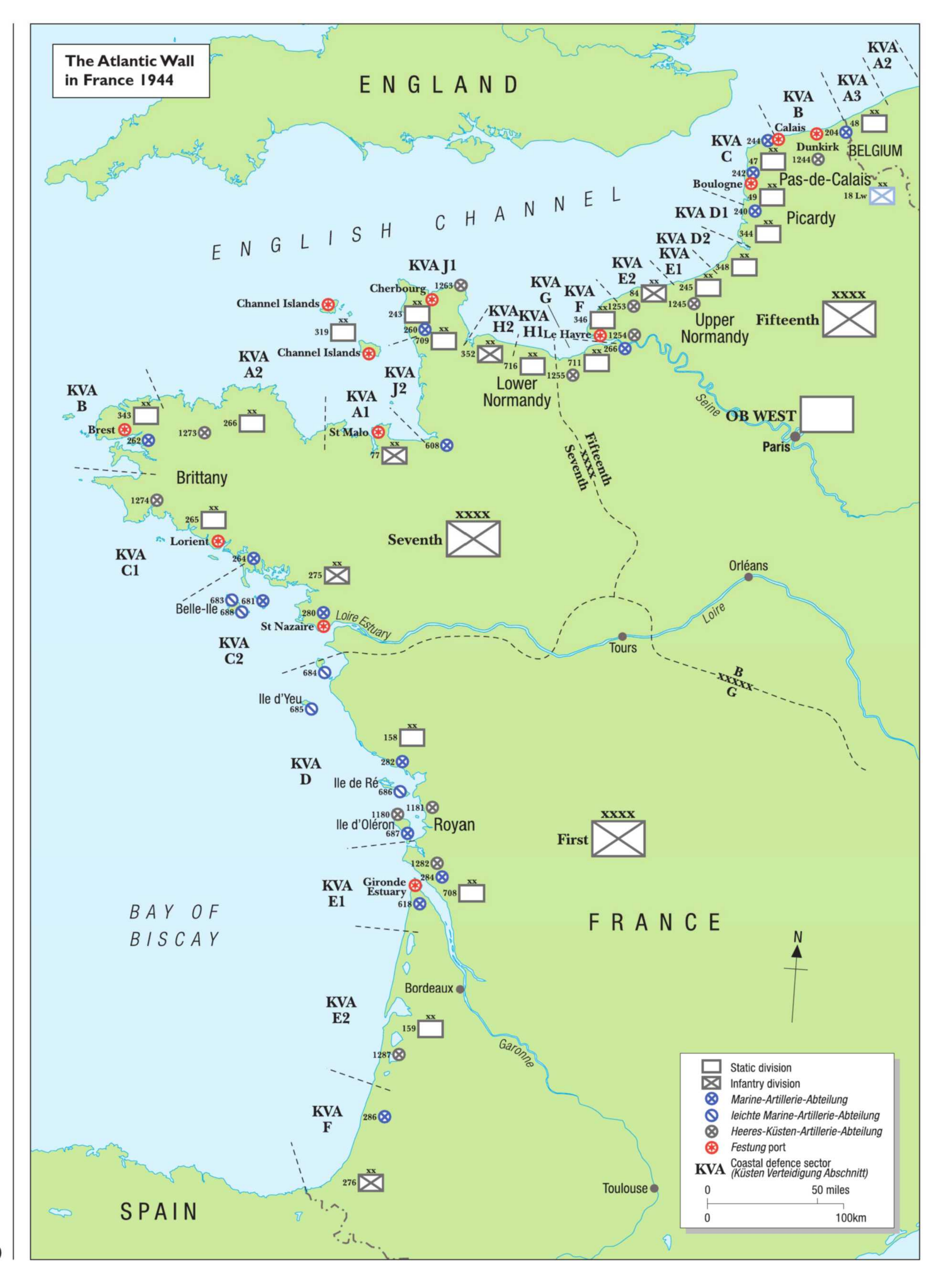
British Commando raids continued in early 1942, including the daring raid on Bruneval to secure a Würzburg Radar. With the Wehrmacht bogged down in Russia, it seemed likely that the Western Front would remain on a defensive posture for some time to come. The evolving strategic situation led Hitler to issue Führer directive No. 40 on March 23, 1942, which laid the groundwork for the Atlantic Wall. The directive provided few specifics about the actual nature of the fortification, and it reaffirmed earlier priorities, with Norway and the Channel Islands being singled out for special attention. The ink was hardly dry on the new directive when it was followed a few days later by the dramatic raid on St. Nazaire, which managed to severely damage the vital dry docks there. This led Hitler to refocus the attention of the earlier directive, with a new emphasis on the defense of ports to prevent a repeat of the St. Nazaire raid. The first serious planning meeting for the Atlantic Wall occurred in May 1942 at Wehrwolf, the Führer headquarters at Vinnitsa, and attending the meeting was the new Reichsminister for Armaments Albert Speer, who had taken over the Organization Todt following the death of Fritz Todt in an airplane crash in February.

The Organization Todt was a paramilitary construction organization created in the 1930s to undertake major state projects including the autobahn and the Westwall defensive fortifications. Since the Wehrmacht had very modest construction capabilities, the Organization Todt was responsible for nearly all of the major fortification and military construction programs in France and the neighboring countries, including the gun batteries on the Pas-de-Calais, the new U-boat bunkers on France's Atlantic coast, and the fortifications on the Channel Islands. The Wehrmacht's *Festungspionere Korps* (Fortress Engineer Corps) under the Inspector of Engineers and Fortifications was responsible for designing and supervising the construction of fortifications by Organization Todt.

Serious construction efforts on the Atlantic Wall began in June 1942, and this was the first time that concrete consumption for the new fortifications exceeded that for the U-boat pens. On August 13, 1942, Hitler held a meeting with Reichsminister Speer and the senior OB West engineer staff to outline the

MKB Graf Spee of 5./MAA.262 in Lochrist near Brest was armed with the Krupp 280mm SKL/40 M06 originally built for the old Brauschweig class of warships and previously located on one of the Friesian islands off the northern German coast before being transferred to Brittany in 1940. Three of the four guns were in open pits like this one, and only one in a large casemate. (NARA)




The Atlantic Wall in France 1944
ENGLAND
ENGLISH CHANNEL
BAY OF BISCAY
SPAIN
FRANCE
BELGIUM
Brittany
Lower Normandy
Upper Normandy
Pas-de-Calais
Picardy
Seventh
Fifteenth
First
OB WEST
Paris
Orléans
Tours
Bordeaux
Toulouse
Royan
Cherbourg
Le Havre
Calais
Dunkirk
Boulogne
Brest
Lorient
St Malo
St Nazaire
Channel Islands
Belle-Ile
Ile d'Yeu
Ile de Ré
Ile d'Oléron
Gironde Estuary
Loire Estuary
Loire
Seine
Garonne
Static division
Infantry division
Marine-Artillerie-Abteilung
leichte Marine-Artillerie-Abteilung
Heeres-Küsten-Artillerie-Abteilung
Festung port
KVA Coastal defence sector (Küsten Verteidigung Abschnitt)
0 50 miles
0 100km



Among the massive coastal artillery casemates on the Pas-de-Calais was Turm West of MKB Oldenburg MAA.244, armed with a 240mm SK L/50, originally a Tzarist 254mm gun captured in 1915 and re-chambered by Krupp. The two casemates of this battery were specialized SK designs built to the heavy Standard A with 3m-thick walls and ceilings. In the foreground is one of the associated H621 personnel shelters. (Author's collection)

strategic aim of the Atlantic Wall: "There is only one battle front [the Russian Front]. The other fronts can only be defended with modest forces … During the winter, with fanatical zeal, a fortress must be built which will hold in all circumstances … except by an attack lasting for weeks." Hitler planned to defend the 3,800km (2,400 miles) of coastline from Spain to Norway using 15,000 bunkers and 300,000 troops with completion by May 1943, the earliest time an Allied invasion was likely. Hitler placed the emphasis on the defense of ports that were viewed as the most likely Allied objectives while the open beaches in between ports were assigned a lower priority. Hardly had this meeting been concluded when on August 17, 1942, the Allies struck at Dieppe with Operation *Jubilee*.

This large-scale raid was a fiasco and demonstrated that even a modestly fortified port could be defended. Dieppe was held by two under-strength battalions of Infanterie Regiment 571, 302.Infanterie Division, a typical second-rate occupation unit. The seacoast town was partially fortified with some concrete bunkers plus machine guns and other weapons in field entrenchments. While the fortifications were not especially numerous by later standards, the cliffs on either side of the 1.5km-wide beach provided a natural overwatch position for enfilade fire along the coast. A pair of naval artillery batteries were located on either side of the town, armed with a total of ten 105mm guns, but they played little role in repulsing the main attack. Once the raid began the German commander rushed the divisional anti-tank company to the town which played a role in stopping the Canadian Churchill tanks trapped on the beach by the seawalls, tank traps and treacherous shingle. For the Wehrmacht, the Dieppe raid re-affirmed the value of coastal defenses in enabling badly over-extended units to defeat amphibious attacks. It also reinforced the Wehrmacht's belief that the main Allied invasion would be directed against a port.

Some German officers felt that the success in repelling the Dieppe raid was exaggerated, distorting later plans for the defense of France. General Freiherr Leo Gehr von Schweppenburg, who later led the Panzer forces in France during the Normandy campaign, argued that:

> The basic misconception of the anti-invasion defense stemmed from the opinions based on the Dieppe raid. The personal ambition of a certain



In some cases, the Germans integrated existing French coastal defense positions into the Atlantic Wall. This triple-tier fire-control post was part of MKB Seeadler located on Pointe du Brulay near Cap Lévy east of Cherbourg, armed with French 194mm guns in kettle emplacements. (NARA)

> military personality in the west [Gen.Maj. Kurt Zeitzler, chief of staff of OB West] and above all the subsequent propaganda nonsense had changed the story of the Anglo-Saxon experimental raid on Dieppe into a fairy tale of defensive success against a major landing attempt. This was all the more irresponsible as captured orders clearly indicated a time limit for the operation. The self-satisfied interpretation could never be dislodged from the minds of high command. Together with Rommel's fallacious theories of defense, it was responsible for the grotesque German situation [in France].

For the Allies, Dieppe provided valuable lessons into the realities of assaulting fortified ports, even one as weakly protected as Dieppe. It convinced British planners that it would be wiser to stage future assaults away from ports against more thinly defended beaches. These lessons were at the heart of the plans for Operation *Neptune*, the D-Day amphibious assault in Normandy two years later.

In 1943–44, OB West designated several port areas as fortresses (*Festung*) included Dunkirk, Calais, Boulogne, Le Havre, Cherbourg, St. Malo, Brest, Lorient, St. Nazaire, the Gironde estuary and the Channel Islands. The US invasion of French North Africa in November 1942 prompted the Germans to occupy Vichy France, adding another coastal region to the list. The Mediterranean coastal fortifications were dubbed the Südwall and are outside the scope of this book. In the event, the Mediterranean ports of Marseilles, and Toulon retained the lesser and earlier designation as "fortified areas," as did some Atlantic ports such as La Rochelle and Bayonne. The *Festung* ports were to be fortified on both the seaward and landward sides and were to be provisioned to be able to hold out for at least three months.

Kriegsmarine defenses in France

German naval forces in occupied France in 1943-44 were under the command of Marine-Gruppekommando West based in Paris, led by Admiral Theodor Krancke since April 20, 1943. MGk-West in turn was divided into regional sector commands of which the most important was Admiral Kanalküste (Channel Coast

Admiral), which replaced the earlier Marine-Befelshaber Kanalküste (Channel Coast Naval Command) in April 1943 and which was led by Vizeadmiral Friederich Rieve. The other sectors of the coast were the Marbef Bretagne for Brittany and the Admiral Atlantikküste for the sector from St. Nazaire to Spain. These regional commands were in turn sub-divided into nine *Seekommandant* (Seeko) of which seven were along the Atlantic Wall:

Command	Headquarters
Seeko Pas-de-Calais	Calais
Seeko Seine-Somme	Le Havre
Seeko Normandie	Cherbourg
Seeko Kanalinseln	Guernsey
Seeko Bretagne	Brest
Seeko Loire-Gironde	St. Nazaire
Seeko Gascogne	Royan

The Seeko headquarters in turn controlled a variety of naval units in their sector. The most important were the harbor commands with a Hako (*Hafenkommandant*: port commander) in the larger ports and a Haka (*Hafenkapitän*: harbor captain) in the smaller ports. These commands usually included a port police force (*Hafenüberwachung*). The Kriegsmarine had an active program for using naval mines for coastal defense, but this subject is largely outside the scope of this book. Of somewhat more relevance are controlled mines for harbor defense. The raids on St. Nazaire and Dieppe made it quite clear that existing net and boom harbor defenses were inadequate and led to further examination of controlled mines for harbor defense, a tactic previously shunned by the Kriegsmarine in France. Controlled minefields were left inactive to permit friendly vessels to pass, but could be made active in the event of a raid to protect the harbor. The standard types in German service were modifications of existing naval mines such as the RMA, RMB, RMH and KMB but fitted with a remote activation device and tethered by a submarine cable which led back to a mine control station in the port. These mines were eventually deployed in a number of French harbors, but a shortage of mines led to the local development of the so-called Franz WB (*Französische Wasser-Bombe*: French depth charge) using captured stocks of French depth charges. These controlled mine units were also responsible for the deployment of harbor demolition mines, which were used in several ports, such as Cherbourg, St. Malo and Brest, to wreck vital equipment prior to the surrender of the ports to the Allies.

German coastal defense doctrine placed considerable importance on light coastal forces such as torpedo boats and small submarines and these were under the control of Defense Command-West (Befelshaber der Sicherung West) with three defense divisions (*Sicherungs Division*) in French waters, the 2.Sicherungs Division on the Channel, the 3.Sicherungs Division from Brittany to the Loire estuary, and the 4.Sicherungs Division on the Atlantic coast. These naval forces are outside the scope of this book.

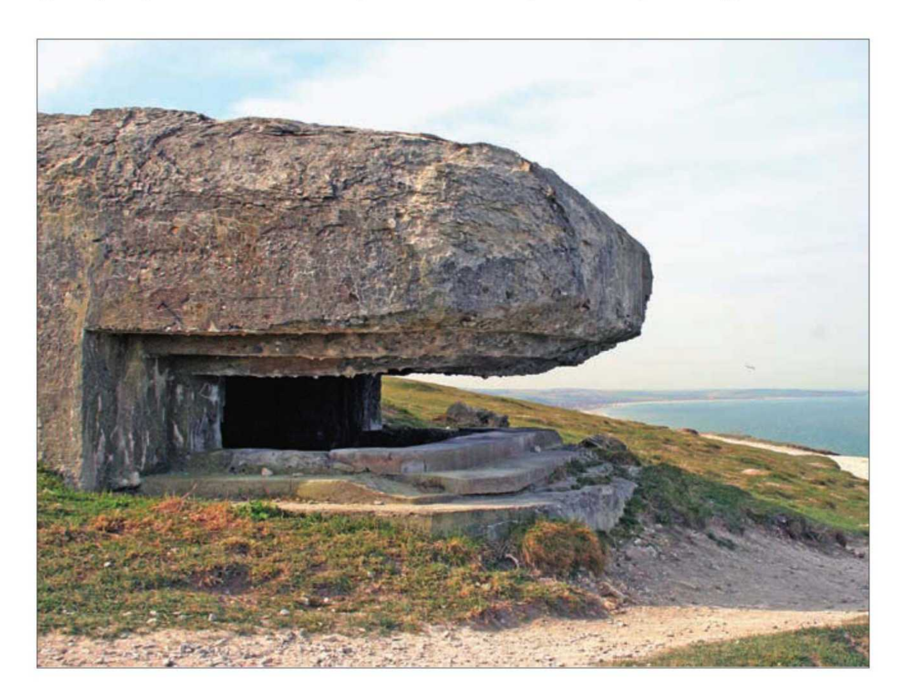
From a coastal fortification standpoint, the most significant units were the coastal artillery battalions. There were three principal types, the *Marine-Artillerie-Abteilung* (MAA), the *leichte Marine-Artillerie-Abteilung* (leMAA: light naval artillery regiment) and the *Marine-Flak-Brigade* (MaFl-Br). Each naval artillery regiment consisted of several gun batteries, each battery deployed at a single coastal artillery post with several guns, a fire-control bunker and associated defensive and support positions. There were 14 regiments along the Atlantic Wall in France plus two more (MAA.604 and 605) on the Channel

OPPOSITE **Batterie Lindemann**

The *Schleswig-Holstein* battery armed with three Krupp 406mm SKC/34 guns was originally installed on the Hel Peninsula near Danzig but in early 1941 the Kriegsmarine decided to redeploy these guns to the Pas-de-Calais. The site selected for the new battery was Noires-Mottes, located between Cap Blanc-Nez and the coastal town of Sangatte. Each casemate consumed some 17,000m^3 of concrete and the guns were mounted in fully armored Schiessgerüst C/39 turrets. They were entirely self-contained with their own power generation and ammunition magazines. The three guns were directed by a massive fire-control bunker based on the S100 type, which included a large Lange optical rangefinder and was supported by a Würzburg See-Reise FuMO 214 surface-search radar located nearby on Cap Blanc-Nez, as well as several other observation and range-finding posts.

These guns had originally been designed to arm a new class of battleship that was never built. The massive casemates for the guns were the S262 types, measuring about 50m in length and 17m in height. The three casemates were named Anton, Bruno and Cäsar. Anton and Cäsar became operational in June 1942 and Bruno in July, but at this stage their full concrete casemate had not been completed. They did not begin any major bombardment of the English coast until November 1942. The battery was initially named Grossdeutschland and was part of StP Neuss. It was manned by MAA.244 and commanded by Kapitänleutnant MA Werner Lokau. In September 1942, the battery was renamed after the captain of the ill-fated battleship *Bismarck*, Ernst Lindemann.

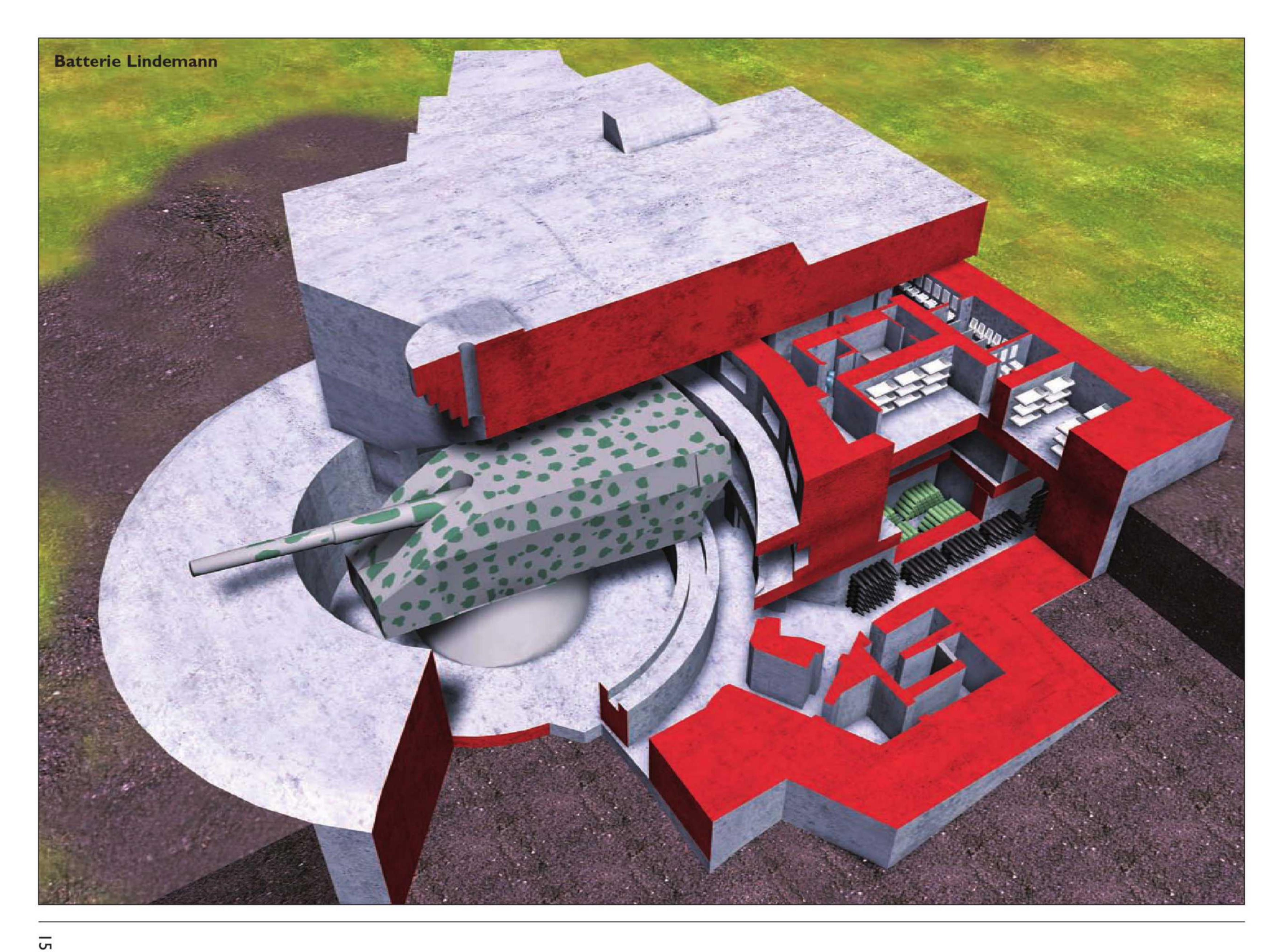
In total, the three guns of the battery fired 2,450 rounds including 1,242 against coastal traffic, 593 against English ports, 235 against the city of Dover, 186 against British coastal batteries and 194 against unrecorded targets. Batterie Lindemann was a frequent target of British air-raids as well as counter-battery fire by British coastal guns and over 1,600 impacts were recorded in its perimeter, with about 45 hitting the gun casemates. The attacks left the terrain around the batteries a lunar landscape but failed to damage the gun casemates, and only two personnel were killed in the three years of counter-bombardments. The Canadian North Shore Regiment finally captured the battery on September 25, 1944. A half-century later, the casemates were submerged under spoil and an artificial pond created from the construction of the Eurotunnel, which runs directly under the site. (Artwork by Lee Ray)



The heights of Cap Blanc-Nez overlooked the cliffs of Dover across the English Channel and so were the site of several observation posts like this one and two other examples further down the slope. (Author's collection)

Islands. The light naval artillery battalions were peculiar to the Atlantic coast islands and were hybrid formations consisting of a few gun batteries and a few companies of naval infantry for island defense. The navy Flak brigades, as their name implies, controlled major port anti-aircraft sites. There were three of these: III.MaFl-Br at Brest; IV.MaFl-Br at Lorient; and V.MaFl-Br at Saint-Nazaire.

One approach to coastal defense rarely used on the Atlantic Wall in France was the shore-based torpedo battery. The Kreigsmarine was made painfully

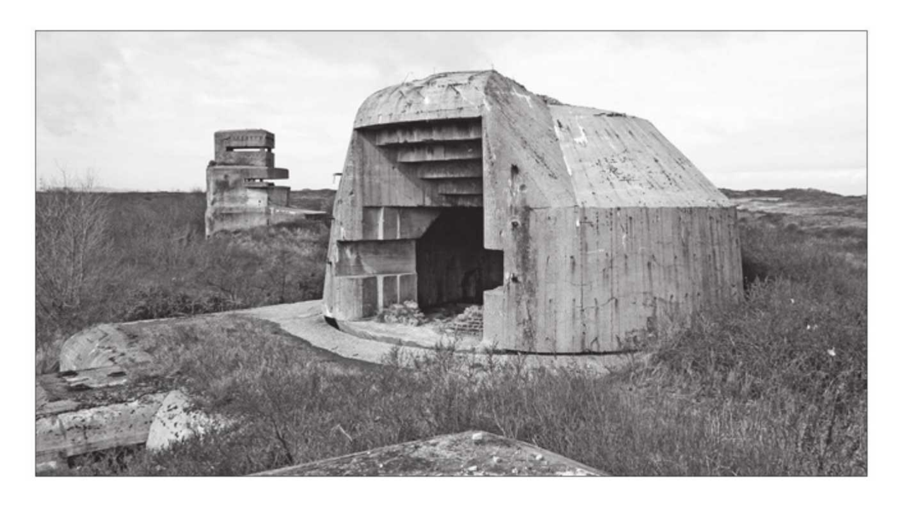

Batterie Lindemann

aware of the capabilities of such batteries with the loss of warships in the 1940 Norwegian campaign, and developed a shore-based version of the standard TR 53.3 Einzel launcher from the S.Boote torpedo boat, which fired the 533mm G7a torpedo. However, these weapons were expensive and not as well suited to the open coastline of France as the constricted fjords of Scandinavia. The only significant use of shore-based torpedo stations in France was around the harbor of Brest where batteries were installed in 1942 near Crozon Island at Fort Robert and Cornouaille Point.

Naval coastal artillery regiments in France 1944

Abteilung	Sector	1st battery	2nd battery	3rd battery	4th battery	5th battery	6th Bbattery	Additional batteries
MAA.204	Ostende /Dunkirk	4 x 105mm	4 x 164.7mm	4 x 150mm	4 x 210mm			
MAA.244	Calais	2 x 240mm	3 x 194mm	4 x 164.7mm	2 x 280mm	3 x 406mm	4 x 150mm	
MAA.242	Gris-Nez	4 x 155mm	4 x 280mm	3 x 170mm	4 x 380mm	3 x 150mm		
MAA.240	Boulogne	4 x 75mm	3 x 305mm	4 x 194mm	4 x 150mm	3 x 138mm	1 x 150mm	4 x 94mm; 4 x 105mm
MAA.266	Le Havre	3 x 380mm	4 x 155mm	4 x 150mm	2 x 150mm	3 x 94mm	3 x 138mm;	2 x 75mm; 2 x 105mm; 3 x 150mm
MAA.260	Cherbourg	4 x 94mm	4 x 94mm	2 x 105mm	4 x 105mm	4 x 105mm	4 x 150mm;	4 x 150mm; 4 x 170mm; 4 x 240mm
MAA.608	Saint-Malo	6 x 194mm	4 x 105mm	4 x 120mm				
MAA.262	Brest	4 x 150mm	4 x 105mm	4 x 75mm	4 x 164mm + 4 x 75mm	4 x 150mm	3 x 88mm + 3 x 152mm;	4 x 280mm
MAA.264	Lorient	4 x 170mm	4 x 164mm + 2 x 150mm	4 x 150mm	3 x 340mm	4 x 203mm		
leMAA.683	Belle Ile	2 x 75mm	3 x 75mm	4 x 105mm				
leMAA.688	Belle Ile	4 x 138mm	2 x 75mm	3 x 75mm				
MAA.681	Ile de Groix	4 x 105mm	4 x 75mm	4 x 75mm				
MAA.280	Saint-Nazaire	4 x 75mm	4 x 105mm	4 x 170mm	2 x 240mm	2 x 240mm		
leMAA.684	Ile de Noirmoutier	4 x 75mm	2 x 105mm	2 x 75mm	2 x 75mm	4 x 155mm	2 x 155mm	
leMAA.684	Ile d'Yeu	10 x 75mm	3 x 75mm	3 x 75mm				
leMAA.685	Ile d'Yeu	3 x 75mm						
MAA.282	Ré/La Pallice	3 x 150mm	4 x 75mm	4 x 75mm	4 x 203mm	4 x 88mm		
leMAA.686	Ile de Ré	3 x 75mm	4 x 75mm	4 x 75mm	2 x 75mm	6 x 75mm	4 x 155mm	
leMAA.687	Ile d'Oléron	2 x 75mm	4 x 75mm	2 x 155mm	4 x 75mm	4 x 75mm	4 x 155mm	4 x 75mm
MAA.284	Royan	3 x 75mm	4 x 138mm	4 x 150mm	4 x 164mm	2 x 240mm	4 x 105mm	4 x 75mm + 4 x 105mm
MAA.618	Pointe de Grave	4 x 105mm	4 x 88mm	4 x 88mm	4 x 88mm	4 x 150mm	4 x 88mm	
MAA.286	Saint-Jean-de-Luz/Bayonne	4 x 150mm +4 x 164mm	4 x 155mm	6 x 75mm	4 x 75mm	4 x 105mm		

*leMAA= *leichte Marine-Artillerie-Abteilung*



The most technologically advanced naval fortification on the Atlantic Wall was this experimental turret for a 150mm SK C/28 gun located in the coastal marshes near Fort Vert east of Calais. The turret used stressed steel wire instead of rebar to reduce the weight of the turret and it was fully traversable using a warship-type race. As a result, it was able to turn landward to fire on approaching Canadian troops in September 1944, and the turret remains locked in this position today. The fire-control post in the background served the nearby MKB Oldenburg. (Author's collection)

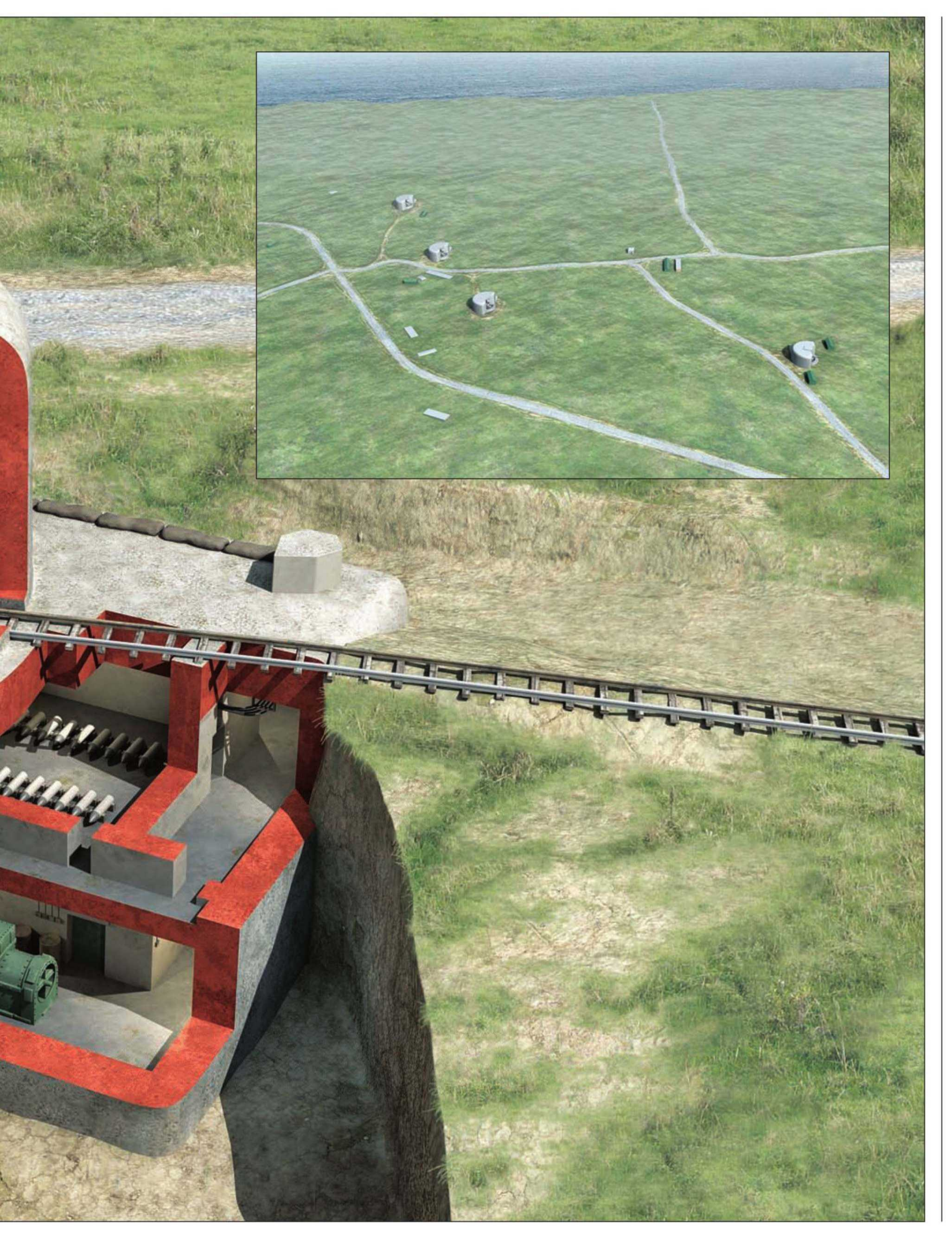
German Army defenses in France

Until 1943, the areas between the ports were much less heavily defended than the ports. The naval coastal artillery batteries tended to be clustered around the key ports, leaving significant expanses of coastline without any protection. These were gradually covered by army coastal artillery batteries deployed along the coast like "a string of pearls" to provide a basic defensive barrier. Coastal artillery was viewed as an excellent expedient since a single battery could cover about 10km of coastline to either side of the battery. In addition, the resources needed were fairly modest since most of the batteries were created using captured French, Russian or other weapons. As in the case of other defenses, the army's coastal batteries were most heavily deployed along the Pas-de-Calais and Upper Normandy in the Fifteenth Army sector, with an average density of one battery every 28km, while in the Seventh Army sector from Lower Normandy around the Cotentin Peninsula, the density was only one battery every 87km. As can be seen from the charts below, the Fifteenth Army had nearly double the density of artillery of the other two sectors, averaging nearly one gun per kilometer. This certainly did not live up to the propaganda image of the Atlantic Wall. German tactical doctrine recommended a divisional frontage of 6 to 10km, implying a density of about five to eight guns per kilometer, substantially more than average Atlantic Wall densities.

Army coastal artillery units in France 1944

Army	Unit	Sector	Batteries	Weapons
Fifteenth Army	HKAA.1244	Dunkirk	6	18 x 155mm, 12 x 88mm
(AOK 15)	HKAR.1245	Dieppe	7	6 x 170mm; 4 x105mm, 4 x 220mm 12 x 88mm
	HKAR.1253	Fécamp	4	18 x 155mm; 4 x 105mm
	HKAR.1254	Le Havre	4	12 x 105mm; 3 x 170mm
	HKAA.1255	Deauville	4	18 x 155mm; 4 x 105mm
Seventh Army	HKAA.1260	Caen	4	12 x 155mm; 4 x 122mm; 4 x 150mm
(AOK 7)	HKAR.1261	Cotentin	10	16 x 105mm; 4 x 122mm; 12 x 155mm; 3 x 170mm; 3 x 210mm
	HKAA.1273	N. Brittany	2	8 x 105mm
	HKAA.1274	S. Brittany	2	4 x 220mm; 4 x 105mm
First Army	HKAR.1181	La Rochelle	4	16 x 155mm
(AOK 1)	HKAR.1180	Ile d'Oléron	4	8 x 100mm; 8 x 150mm
	HKAA.1282	Royan	5	12 x 105mm; 6 x 114mm; 6 x 152mm
	HKAR.1287	Bordeaux	6	18 x 152mm; 12 x 105mm


Batterie Todt



PREVIOUS PAGE **Batterie Todt**

Construction of Batterie Siegfried began in August 1940, armed with four 380mm SKC/34 in B-Gerüst C/39 turrets, near the village of Haringzelles. The battery was located close to the sea and within sight of Cap Gris-Nez where several supporting observation posts were located. The four turrets were of a special design consisting of a main circular gun casemate with a smaller multistory bunker for ammunition and support located to the left of the gun pit. Each casemate consumed 800 tonnes of steel and 12,000m^3 of concrete.

The battery was declared operational on January 11, 1942, and it was renamed later in the year in honor of the head of the Organization Todt, Fritz Todt, who died in a plane crash on February 8, 1942. Unlike Batterie Lindemann, the four gun turrets were not named, but simply numbered from 1 to 4, with Turret 4 being the one located closest the sea and Turret 1 being the furthest inland and the site of today's Musée de Mur de l'Atlantique.

This battery was part of MAA.242 and was commanded by Kapitänleutnant MA Klaus Momber. The battery was part of StP 186 Saitenspiel, which included numerous support facilities, defensive positions and anti-aircraft batteries. The associated surface search radar and optical rangefinder for the battery was positioned along the cliffs near the village of Cran-aux-Oeufs about 1km to the northwest.

Like Batterie Lindemann, Batterie Todt was engaged in bombardment of Channel shipping in 1942–44 as well as periodic campaigns against English ports, coastal towns, and coastal artillery batteries. The battery's most active combat took place in the summer of 1944 when in took part in a campaign against Dover and Folkestone along with Batterien Lindemann and Grosser-Kurfürst. As Canadian troops closed in, it fired for the last time on September 29, 1944, hours before its surrender. (Artwork by Hugh Johnson)



Some of the ports along the Atlantic Wall were protected by controlled minefields. To supplement German mines, the Franz WB was developed based on surplus French depth charges. These mines were also used to demolish harbor facilities prior to their surrender. (NARA)



One style of camouflage for the shoreline casemates was *trompe l'oeil* painting, intended to make the bunker look like a harmless civilian home. This example is certainly more elaborate than most, complete with a cart in the false garage. This Canadian soldier is looking into the gun embrasure of the casemate, which had been covered with a false wooden cover now on the ground. (NAC PA-131229 Ken Bell)

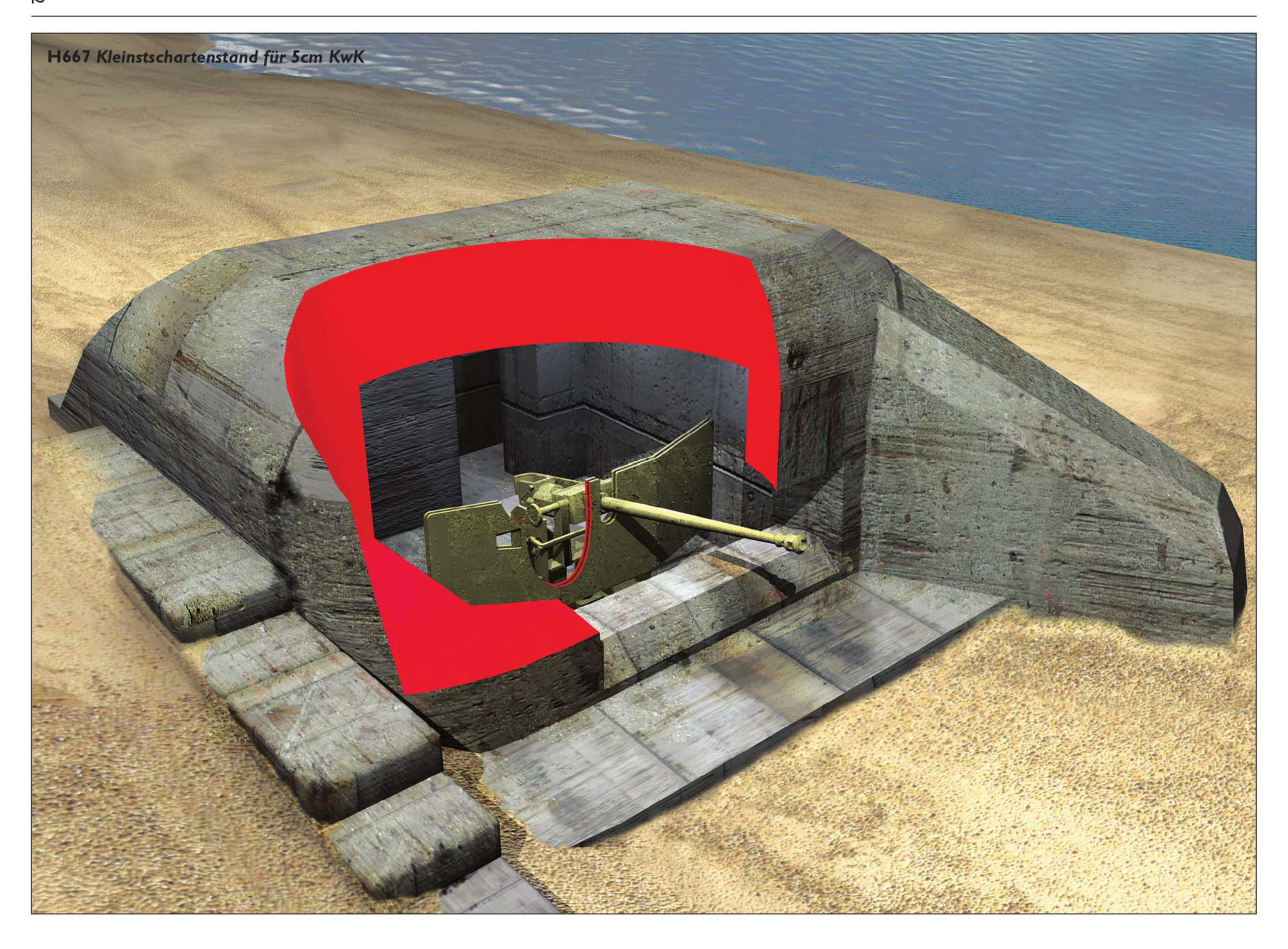
Atlantic Wall artillery in France by type

Caliber	Navy coastal	Army coastal	Army railroad	Army field	Sub-total
75mm	129	0	0	4	133
76.2mm	4	0	0	144	148
88mm	23	24	0	0	47
100mm	0	0	8	96	104
105mm	64	116	0	164	344
Other light	23	6	0	12	41
122mm	0	18	0	80	98
150mm	56	4	4	72	136
155mm	28	106	0	210	344
Other medium	45	24	0	0	69
170mm	19	34	0	22	75
210mm	4	3	1	8	16
240mm	12	0	5	0	17
280mm	10	0	15	0	25
Other heavy	37	14	2	0	53
Total	454	349	35	812	1,650

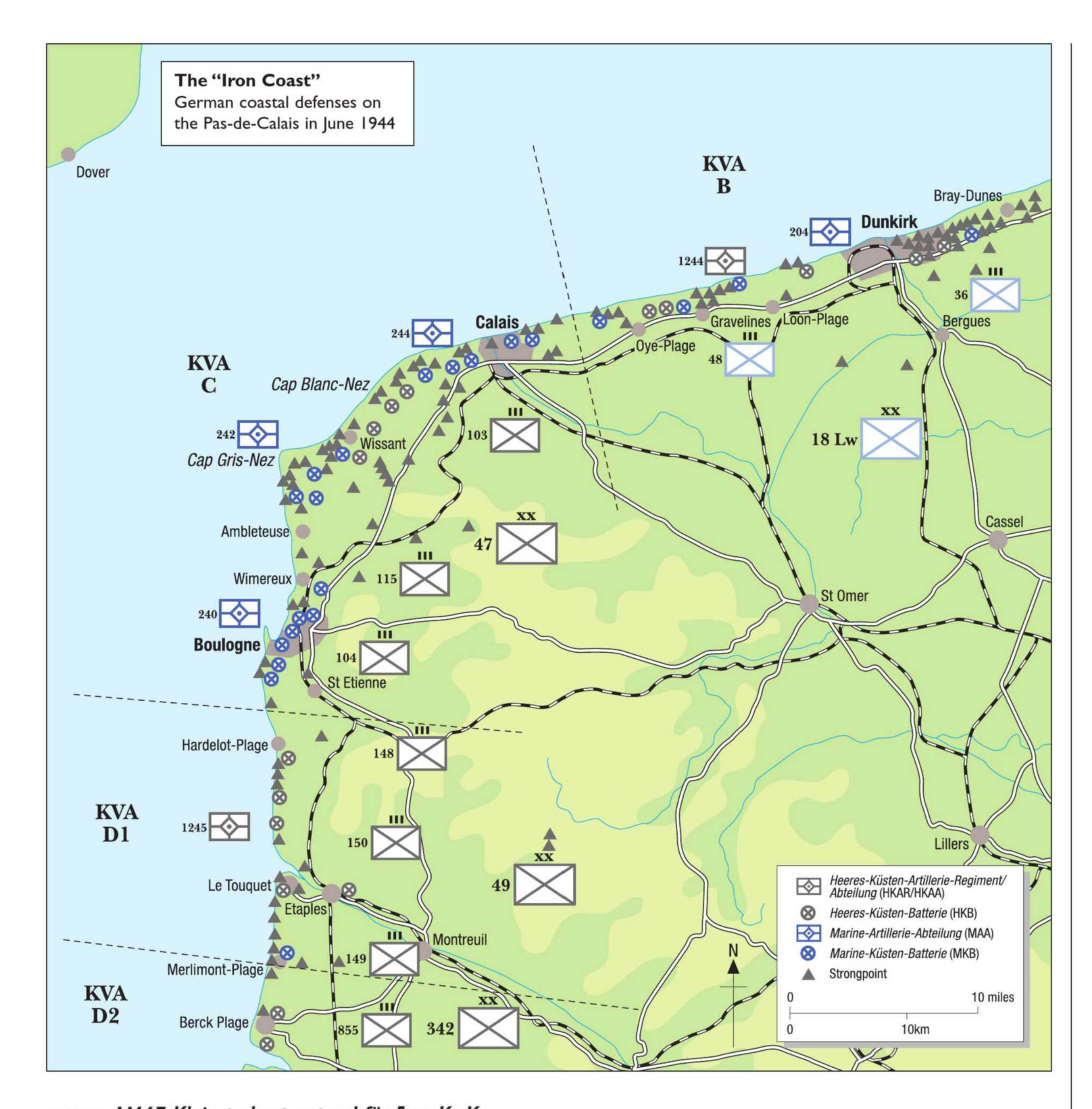
Atlantic Wall artillery density by sector

Sector	AOK 15	AOK 7	AOK 1	Sub-total
Coastline (km)	708.5	1,566	817.9	3,092.4
Service	Army/Navy	Army/Navy	Army/Navy	
Light (75–105mm)	256/35	282/87	90/135	885
Medium (150–155mm)	259/35	133/33	72/47	579
Heavy (170–406mm)	46/39	17/37	41/6	186
Sub-total	561/109	432/157	203/188	1,196/454
Total	670	589	391	1,650
Guns per 10km	9.5	3.8	4.8	5.3

Although the coastal artillery batteries were an economical way to cover large areas of coastline with minimal coverage, they could do little against Commando raids. The task of patrolling the coastline was assigned to the infantry divisions stationed near the coast. These sectors consisted of divisional KVA (*Küsten Verteidigung Abschnitt*: coast defense sector), further broken down into regimental KVG (*Küsten Verteidigung Gruppen*), battalion-strength strongpoint groups (*Stützpunktgruppe*), company-sized StP (*Stützpunkt*: strongpoints) and finally platoon-sized WN (*Wiederstandnest*: resistance points). Since the Kriegsmarine received the bulk of the construction work in 1943, these positions were often little more than field entrenchments with a small number of fortified gun pits and personnel shelters. Except on the Pas-de-Calais, there was little fortification of the infantry coastal defenses until 1944. The bunkers and defensive positions were intended to compensate for the severe shortage of troops. German tactical doctrine recommended that an infantry division be allotted no more than 6–10km of front to defend, but the occupation divisions in France were frequently allotted 50 to 100km of coastline to defend, sometimes even more in the remoter locations of Brittany or the Atlantic coast.



H667 ***Kleinstschartenstand für 5cm KwK***



OPPOSITE **H667 *Kleinstschartenstand für 5cm KwK***

The H667 was the most common anti-tank gun casemate built on the Atlantic Wall, with some 651 constructed in 1943–44, of which 443 were built on the French coast. Construction of this type began in January 1943 and each required 165m^3 of concrete, 7.5 tonnes of steel rebar and 1.3 tonnes of other steel. These were designed to provide better protection than the common Vf600 open gun pits widely used for the pedestal-mounted 50mm gun. This weapon consisted of obsolete KwK 39 and KwK 40 tank guns mounted on a simple pedestal (*Sockellafetten*) with a spaced armor shield added in front. During 1944, some of these guns were re-bored to fire 75mm ammunition. Since the gun was mounted on a fixed pedestal, there was no need for a rear garage door as was so characteristic of other Atlantic Wall gun casemates. (See for example the H677 for the 88mm gun on page 26 of Osprey Fortress 37: *D-Day Fortifications in Normandy*.) Instead, the casemate had a simple armored door at the rear, protected by a low concrete wall.

This bunker, like the H677, was designed to be placed directly on the beach. It was oriented to fire in enfilade along the beach, not towards the sea. The design incorporated a thick wall on one side or other to shield the embrasure from naval gunfire. The interior was very elementary, large enough for only the crew and a few containers of ammunition. (Artwork by Lee Ray)



This shows the initial stage of construction of a gun casemate with the steel reinforcing bars in place along with the steel frame from the embrasure. This H669 gun casemate was being built near Ozouville in the Cherbourg area in June 1944. (NARA)

The allotment of fortifications was by no means uniform along the coast. In 1943, the Wehrmacht was deployed in three major formations: the Fifteenth Army from Antwerp westward along the Channel coast to the Seine estuary near Le Havre, the Seventh Army from Lower Normandy to Brittany, and the First Army on the Atlantic coast from the Loire estuary near Nantes to the Spanish coast near Bayonne. Of the three main sectors in France, the Fifteenth Army on the Channel coast received a disproportionate share of the fortification, and the Seventh Army much of the remainder. Of the 15,000 bunkers envisioned under the 1942 plan, 11,000 were allocated to the Fifteenth and Seventh Armies and the rest to the Atlantic coast of France, the Netherlands, Norway, and Denmark. By way of comparison, the First Army sector, which covered the extensive Atlantic coast facing the Bay of Biscay, was allotted only 1,500 to 2,000 bunkers.

The Organization Todt was responsible for the actual construction of the coastal fortifications, but management of the design and placement of the fortifications was the responsibility of the Wehrmacht's *Festungspionere Korps*. The Kriegsmarine did not formally establish a fortification command until May 1943, so the army's staff was primarily responsible for designing bunkers constructed for the navy; the same was true for the Luftwaffe. The army fortification engineers' plans for the Atlantic Wall were based in part on previous experience in the 1930s in the development of the Westwall fortifications on the French–German border. However, there were some notable differences.

There were continual tensions between the army fortification engineers and the civil engineers of the Organization Todt. The army engineers frequently complained that the Todt engineers were too concerned about "art for art's sake," favoring elaborate construction projects near the ports but shunning more mundane tactical positions on more remote stretches of the coast. The army engineers were more often willing to compromise on building standards in order to get the programs completed on time while the Todt engineers tended to be sticklers for detail, for example insisting on the import of the best grade of German concrete rather than relying on local French concrete. It was the age-old engineering dilemma of "perfection being the enemy of excellence;" the army believing that an adequate structure completed today was better than a superior structure that was never completed.

The initial focus of the Atlantic Wall construction was on coastal artillery positions, a type not widely employed on the Westwall, and so requiring a new family of casemate designs. The initial role of coastal artillery was to stop the invasion force before it reached the shoreline. The configuration of the coastal artillery batteries was a subject of some controversy between the army and Kriegsmarine. The navy had traditionally viewed shore batteries as being an extension of the fleet, and so deployed the batteries along the edge of the coast where they could most easily to take part in naval engagements. As had become evident from attempts to repulse the Allied amphibious landings in the Mediterranean Theater, one of the Allies' main advantages was heavy naval gunfire. As a result, a growing focus of the navy's Atlantic Wall program was to deploy enough coastal artillery to force the Allied warships away from the coast and thereby undercut this advantage. Naval coastal batteries were patterned on warship organization. The four to six guns were deployed with a direct line of sight to the sea, and connected by cabling to an elaborate fire-control bunker, which possessed optical rangefinders and plotting systems similar to those on warships to permit engagements against moving targets. The army derided these

batteries as "battleships of the dunes" and argued that their placement so close to the shore made them immediately visible to enemy warships, and therefore vulnerable to naval gunfire. In addition, the proximity to the shore also made the batteries especially vulnerable to raiding parties or to infantry attack in the event of an amphibious assault.

The army's attitude to the coastal batteries was based on the premise that they were needed primarily to repulse an amphibious attack, not engage in naval gun duels. As a result, the army was content to place their batteries further back from the shore, though some were located along the shore if it gave them particularly useful arcs of fire. For example, this was the case with shorelines edged with cliffs, since by deploying the coastal batteries on promontories, the battery could rake the neighboring beaches with fire, avoiding the cover of the cliffs. The army fire-control bunkers were far less elaborate than the naval bunkers, possessing rangefinders and sighting devices but usually lacking plotting devices for engaging moving targets. The army placed more emphasis on wire or radio connections with other army units, depending on artillery forward observers to assist in fire direction against targets that were beyond line of sight. The navy complained that these batteries were incapable of engaging moving ships.

Besides their differences about coastal artillery tactics, the Kriegsmarine and army had very different views on the ideal technical characteristics of the coastal guns. The navy preferred a turreted gun that could survive in a prolonged gun duel with a warship. A few actual warship turrets were available and were emplaced in areas that had a rock-bed deep enough to accommodate the substructure of the turret: a turret from the *Gneisenau* near Paimpol in Brittany, two turrets from the cruiser *Seydlitz* on Ré Island, the 380mm gun turret from the French battleship *Jean-Bart* near Le Havre. Since armor plate was at a premium and fortification too low on the Reich's priority list, it was impossible to manufacture steel turrets for coastal artillery. This led to the development of casemates to protect the gun against most overhead fire, with a limited armored shield around the gun itself. Such configurations limited the traverse of the gun compared to a turret. This would later prove to be a fatal flaw when the attack came from the landward side since the embrasure seldom permitted more than 120 degrees of traverse, limiting the gun's coverage to seaward targets. The Kriegsmarine was aware of this problem but since its primary mission was to deal with the seaborne threat, this problem was brushed aside.

During 1943, fortification engineers began to experiment with an advanced type of reinforced concrete using wire under stress instead of the usual steel reinforcing bars. This promised to be significantly lighter, leading to plans for a fully traversable concrete turret to get around the limitations of traverse in fixed casemates. An experimental example was completed outside Paris in early 1944, and the first concrete turrets began to be built on the Atlantic Wall. starting with one near Fort Vert to the east of Calais. However, the technology appeared too late in the war to be widely used.

The army did not favor fixed guns like the navy and preferred to use conventional field artillery. This was based on the premise that the batteries could be moved from idle sectors to reinforce the defenses in sectors under attack. The army pointed to previous examples of British amphibious attack, such as Gallipoli, where the amphibious assault became a protracted campaign. At first, the army preferred to use simple kettle mounts patterned on the World War I style, which were simply circular concrete pits with protected spaces for ammunition. The gun itself was completely exposed, but the gun pit was supported by fully protected crew bunkers, ammunition bunkers and a fire-control bunker. This was the predominant type of army coastal battery configuration on the Atlantic Wall from 1942 into early 1943. However, as Allied air activity over the French coast increased in intensity, the vulnerability of these batteries to air attack became the subject of some concern. Intuitively it seemed that the navy's casemates offered better protection from air attack

than the kettle positions. However, based on actual combat experiences, some of the fortification engineers argued that this was not the case. The confined casemate tended to concentrate the blast of any bomb that landed near the gun opening, and it was found that guns in open pits were almost invulnerable to air attack except for the very rare direct hit on the gun itself. In the wake of the Dieppe raid, however, the policy shifted to full protection of the army coastal batteries in casemates. These resembled the navy casemates except that they generally had a large garage door at the rear to permit easy removal of the gun for transfer to other sectors if needed.

The army fortification engineers had established protection standards during the Westwall program based on steel-reinforced concrete (*Beton-Stahl*). Category E fortifications were based on walls and ceilings 5m thick but this standard was uncommon and used mainly for strategic command posts such as the Führer bunkers. The highest level for tactical fortifications was A, which used a 3.5m basis, and this was confined to large, high-priority structures such as the U-boat bunkers and some key facilities such as the heavy gun batteries on the Pas-de-Calais and special military hospitals. Most Atlantic Wall fortifications were built to the B standard, which was 2m thick, proof against artillery up to 210mm and 500kg bombs. Many minor bunkers, such as the ubiquitous tobruks, were built to the slightly lower B1 standard of 1 to 1.2m since these structures were partially buried. The designers attempted to minimize the amount of steel necessary in construction, so aside from the steel reinforcing bars (rebar), steel plate and especially steel armor plate was kept to a minimum. A standardized family of small armored cupolas, doors, and firing posts had been developed during the Westwall program and these were used on the Atlantic Wall as well. Most personnel bunkers and other enclosed bunkers built in 1942–43 were also provided with protection against gas attack both by systems to seal the structure from outside air, as well as filtration systems. Obviously, this was not possible with large gun casemates, but the associated crew bunkers typically had gas protection.

The Fortification Engineer Corps in Berlin designed a family of standardized bunkers for typical applications. Some of these were based on the earlier Westwall program but the majority were newer designs. The original Westwall fortifications had been designated in the OB or Vf series for *Offene Bettung* (open platform) or *Verstarkfeldmässig* (reinforced field position). Although some of these designations were retained during the construction of the Atlantic Wall, a new series of designations emerged. There is some disparity in how these designs are identified so for example, the “611” bunker design is variously called Bauform 611 (construction plan 611); R611 (Regelbau 611: construction standard 611) or H611 (Heer 611: Army 611) to distinguish army bunkers from air force (L: Luftwaffe) and navy (M: Kriegsmarine) bunker designs. There were about 700 of these standard designs of which about 250 were used on the Atlantic Wall. It should be mentioned that these designs were often modified in the field to better match local terrain contours. Besides the standardized designs, there were localized variations of standard plans as well as entirely new designs, sometimes identified with an SK suffix for *Sonderkonstruktion* (special design).

The standard plans covered a variety of functional types. These are by no means the only categories of defensive fortifications, but cover the main types.

Gefechtsstand	Command post
Leitstand	Fire-control post
Beobachtungstand	Observation post
Nachrichtenstand	Communication post
Kampfstand	Combat post
Schartenstand	Artillery casemate
Ringstand	Tobruk
Unterstand	Bunker

The table opposite lists the army bunkers deployed under the three army headquarters (AOK) in France in June 1944. The common types are listed by their designations while less common types are lumped together under their function. This list does not include the category of “reinforced field position” such as tobruks, and open gun pits such as the Vf600 types, which were not considered “bombproof”.

German Army Atlantic Wall bunkers in France, 1944

	AOK 15	AOK 7	AOK 1	Sub-total
Personnel				
H621 (501) single group	393	447	266	1,106
H622 (502) double group	433	398	202	1,033
H668 small bunker for nine men	84	59	70	213
Other personnel bunkers	47	56	16	119
Munitions				
H607 ammunition	102	18	70	190
H134 ammunition	236	66	21	323
Other ammunition bunkers	6	28	28	62
Medical				
Medical and support bunkers	72	57	42	171
Communication				
Communication posts	20	10	6	36
Command				
Command bunkers	98	58	36	192
Artillery observation				
Artillery observation bunkers	54	34	46	134
Weapons shelters				
Weapons garages	52	69	30	151
Gun casemates				
H669 field gun	44	189	141	374
H612 field gun/PaK	133	60	178	371
H667 50mm	35	193	118	346
H630 (H105) MG	178	89	10	277
H671 field gun	38	38	112	188
H634 (H112) turreted MG	52	66	2	120
H680 75mm PaK 40	24	40	47	111
H677 88mm PaK	24	36	43	103
Other gun types	239	165	82	486
Total	2,364	2,176	1,566	6,106



Coastal erosion has left many bunkers stranded on the beach, like this H120 artillery observation bunker on Platier d'Oye east of Calais. It is an interesting example since it is still fitted with its 27P01 armored cupola, a feature that was removed from most bunkers after the war due to its scrap value. (Author's collection)

Principles of defense

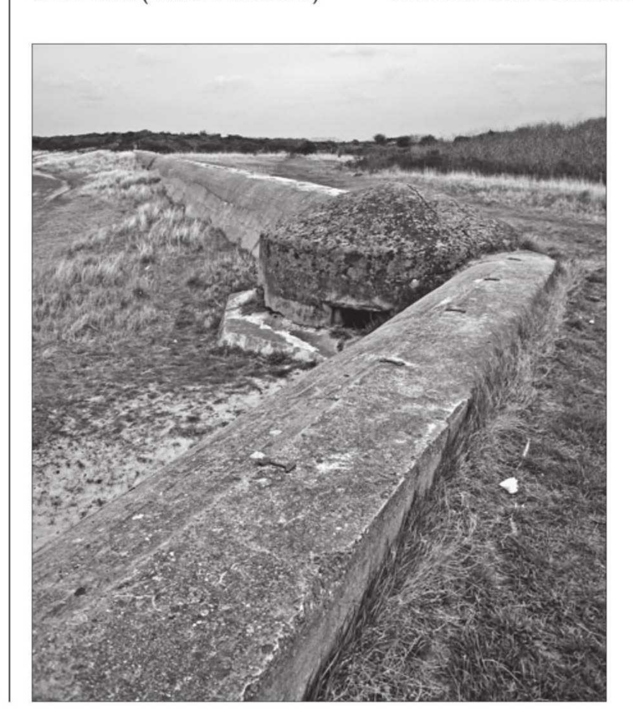
Like many of Hitler's personal passions, the Atlantic Wall was a half-baked scheme. The gnat bites by British Commandos along the French and Norwegian coast provoked Hitler into a massive construction completely out of proportion to its tactical value. Hitler had a visceral enthusiasm for monumental fortification after his experiences as a young infantryman in the trenches in World War I. Ironically, it was the Wehrmacht that had demonstrated the futility of linear defenses against the combined power of mechanized firepower and air attack. Furthermore, the Atlantic coast was so long that it was impossible to create any defense-in-depth with the Atlantic Wall, inevitably resulting in a weak and vulnerable configuration. As Frederick the Great had remarked: "who defends everything, defends nothing."

German military commanders had mixed feelings about the Atlantic Wall concept. Few commanders believed that the Atlantic Wall could repulse a serious Allied invasion, but many at the same time felt that some degree of fortification was worthwhile given the poor quality of the troops assigned to coastal defense. At the heart of this controversy was the poor fit between the Atlantic Wall fortification schemes and army tactical doctrine. This is evident when examining the German tactical response to Allied amphibious attacks in the Mediterranean Theater in 1943–44. Rather than tie down vast resources in a linear defense of the Italian coast, the Wehrmacht did not immediately contest the landings at Sicily, Salerno and Anzio. Instead, once the landings had taken place, the German commanders mobilized their mechanized forces and staged a violent counterattack against the bridgehead.

When von Rundstedt was appointed to head OB West (Supreme Command West) in the spring of 1943, he ordered a comprehensive inspection of the Atlantic Wall defenses which took place from May to October 1943. The problem was not so much the uncompleted Atlantic Wall as the continuing drain of resources out of France to the Russian Front. The infantry divisions stationed in France were second-rate static divisions, which were hardly adequate for positional defense. The continued decline in troop quality in 1943 was somewhat offset by continuing fortification of the coast, since it was widely believed by German commanders that the poor-quality troops would be more likely to resist from the safety of bunkers than from exposed field positions.

Under the circumstances, OB West attempted to meld accepted tactical doctrine with the Atlantic Wall fortifications. The resulting tactics were dubbed "crust—cushion—hammer." The Atlantic Wall was the crust that would stop or delay the initial Allied invasion and give the army time to move its mobile reserves into action. The cushion was the coastal region immediately behind the Atlantic Wall, which would be covered by proposed "Position II" defenses. This was a half-hearted attempt started in November 1943 to provide some defense-in-depth to the Atlantic Wall through a series of field emplacements. Since there was not enough concrete, construction was limited to earthen defense works. In the event, Position II never emerged as a serious

Beach defenses along the Atlantic Wall frequently included anti-tank walls to prevent easy access off the beach. This example on Oye-Plage east of Calais has sunken over the years but shows an interesting example of an improvised machine-gun bunker built into the corner of the walls. (Author's collection)





A fairly typical example of beach obstacles in the Fifteenth Army sector east of Dunkirk in September 1944. The obstacles in the foreground are *Nussknacker* (nutcrackers) made from French artillery projectiles with a pivoting steel trigger designed to blow up under landing craft or tanks. Closer to the sea are a variety of obstacles, mainly wooden tetrahedrons but also some steel Czech hedgehogs. (NAC P-174349 Ken Bell)

defensive program due to Rommel's insistence that the emphasis be placed on the initial "crust" of the Atlantic Wall. The "cushion" of the coastal belt also served as a buffer zone since the Panzer commanders did not want to conduct operations near the beaches within the range of Allied warships based on the lessons of the Mediterranean Theater, where Panzer attacks were repeatedly demolished by naval gun fire. The "hammer" was the OB West reserve, primarily Panzer Gruppe West under the command of General Freiherr Leo Gehr von Schweppenburg.

OB West grew increasingly worried in early autumn of 1943 due to Allied deception plans such as Operation *Starkey*, which suggested an invasion against the Pas-de-Calais could happen at any moment. A pungent view of the state of the Atlantic Wall at this time was provided by a letter from the Fifteenth Army commander, Gen.Obst. Hans von Salmuth, to Gen. Jodl of the OKW staff in Berlin:

> The Atlantic Wall is no wall!! Rather it is like a thin and fragile cord which has a few small knots at isolated places such as Dieppe and Dunkirk. The strengthening of this cord was no doubt under way during the past spring and summer. Since August the effort has been getting steadily weaker … and any considerable increase in bunker construction will not take place til spring [since] material and labor are lacking. When I visit a position, I invariably receive the report "… workers have been transferred to Todt construction work for the Luftwaffe" … usually of course "on the Fuhrer's orders." Hell! Are we army soldiers just dirt?? We are supposed to stand to the last man and to the last bullet. And we do it. Then they should treat us accordingly.

One of the more common types of obstacles deployed in 1944 was a simple post obstruction enhanced by adding a Teller mine on top to blow a hole in the bottom of landing craft. In reality, such mines failed as often as not due to the effect of frequent submersion in seawater, symptomatic of Rommel's slap-dash obstacle program, which argued that "something was better than nothing." (NARA)





This M262 fire-control bunker of MKB Vasouy of 9./MAA.266 was positioned on the Seine River opposite Le Havre. It is typical of naval fire-control posts, with an observation post below and a rangefinder post above. (Author's collection)

With the threat of an Allied invasion of France increasing, even Hitler realized that the Western Front could no longer be ignored. His first action in the autumn of 1943 was to appoint Generalfeld-marschall Erwin Rommel to command the new Army Group for Special Employment (later Army Group B) to direct the invasion front. Hitler also authorized Führer Directive 51 on November 3, 1943, that on paper at least reoriented the strategic priorities for resources and ordered that additional steps be taken to reinforce the Western Front due to the likelihood of Allied invasion sometime in 1944.

Rommel approached his new assignment with characteristic vigor and began a tour of the defenses starting in Denmark in December 1943 and working his way down the French coast in early 1944. He came to this new command with a different perspective than most senior Wehrmacht commanders, having spent the past several years fighting the Allies in the Mediterranean Theater rather than the Red Army on the Russian Front. His last assignment had been the command of German forces in northern Italy. While this did not directly involve him in combating recent Allied amphibious assaults in Italy, he had been involved in the debates over the best approaches to repel the Allied landings. In the case of both Sicily in July 1943 and Salerno in September 1943 the Wehrmacht in Italy had followed the accepted doctrine but it had failed to crush the landings. In both cases, the Allied landings were initially unopposed but Panzer forces were promptly mobilized and the beachhead attacked in force. In both cases, the mechanized attacks were stopped cold by a combination of tenacious Allied infantry defense stiffened by a suffocating amount of naval gunfire. During the course of his inspections along the Atlantic Wall, the Allies launched yet another amphibious attack against Anzio in January 1944 and, once again, the German mechanized counterattacks in February 1944 failed with heavy losses. This only served to reinforce his doubts about the current tactics for dealing with Allied amphibious attacks.

Rommel's iconoclastic views extended to other aspects of the defensive plans. German planning assumed that the most likely location for the Allied invasion would be on the Pas-de-Calais. This was the narrowest point of the English Channel and was close enough to Britain that the invasion force could be supported by fighter aircraft based in southern England. It also offered better prospects for approaches into Germany compared to the soggy lowlands of Holland or the hilly forests of the Belgian–German frontier. As a result, the Atlantic Wall defenses as well as troop dispositions were far denser on the Pas-de-Calais than on any other stretch of the French coast. Yet the fact that it was such an obvious choice led Rommel to wonder whether another location might be more likely. Von Rundstedt and the senior commanders remained convinced



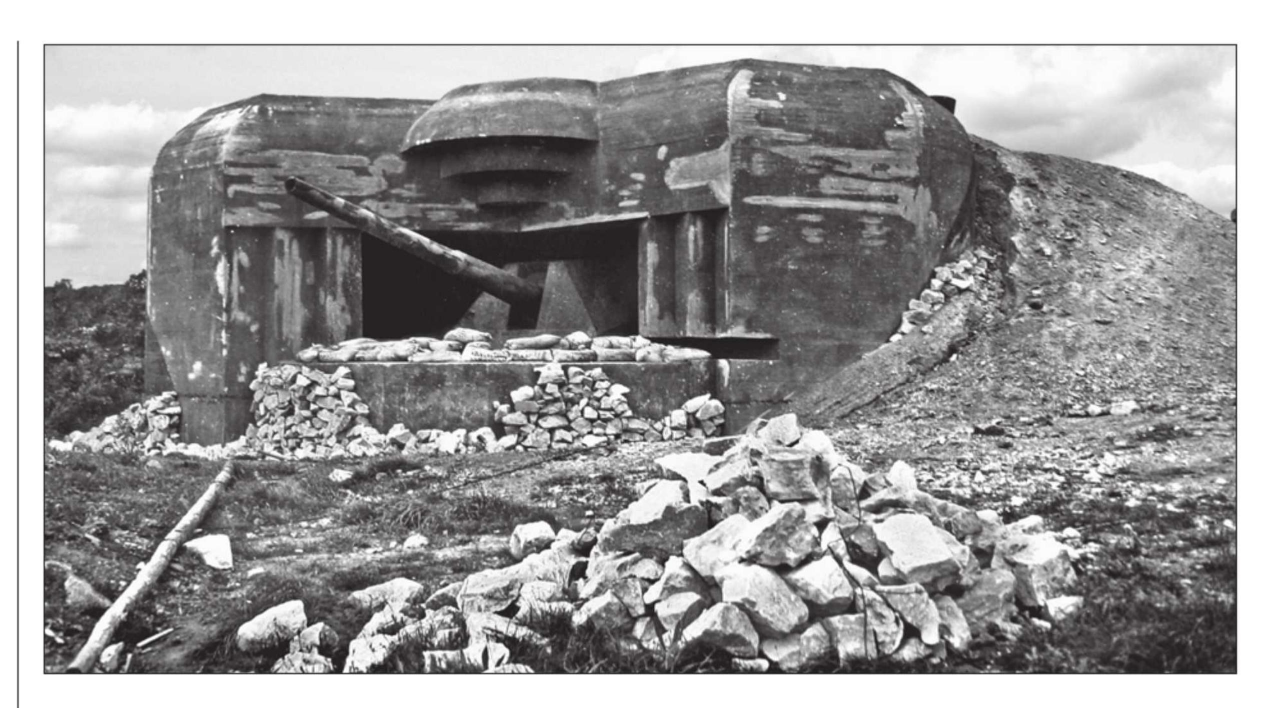
Stützpunkt 164, between Cap Gris-Nez and Cran aux Ouefs, was the site of MKB Tilly of 5./MAA.244 with two M270 casemates armed with 150mm guns. The three large pillars near the casemate are the V143 base for a massive Mammut surveillance radar that supported the neighboring Batterie Todt and other heavy gun batteries in the area. (Author's collection)

that the Allies would strike at or near a port. They had done so at Salerno and Anzio, but the landings at Sicily made it clear that they could conduct an amphibious landing without a port.

Rommel became convinced that new approaches were necessary. From a tactical standpoint, he rejected the current doctrine and argued that instead of defense in depth with the Panzer divisions kept in reserve away from the beaches, all available resources should be moved as close to the likely landing areas as possible. He believed that the Italian campaign had demonstrated that if the invasion could not be stopped immediately, it could not be stopped at all. He also questioned whether the Allies would actually strike at a port. A landing some distance from a port could lead to the eventual envelopment and capture of the port. In spite of Rommel's considerable influence with Hitler, his views were not widely accepted by senior German commanders in France. The debate over the best approach to deploying the Panzer divisions continued right up to D-Day and was not settled to the satisfaction of either side in the debate.

From the perspective of the Atlantic Wall, Rommel's leadership had several important consequences. Rommel invigorated efforts to defend the beaches between the major ports, especially along the Pas-de-Calais and Normandy. By early 1944, the Kriegsmarine had received the bulk of Organization Todt's resources and the ports had been well fortified. More attention had to be directed to the army's shoreline defenses. Besides enhancing the fortifications along the coast, Rommel suggested that more attention had to be paid to extending defenses out on the beaches. His own experiences in the desert campaign had convinced him of the value of mine warfare and obstacles. Rommel argued that by creating obstructions along the coast, amphibious landing craft would be prevented from reaching the shelter of the shoreline. In combination with enhanced beachfront fortifications, this would create a killing zone along the shoreline. Instead of landing near the protective seawalls so common on the Channel coast, the infantry would have to disembark hundreds of meters from shore, exposed to prolonged fire as they attempted to reach the sanctuary of the shoreline. In contrast to his arguments about defensive tactics, Rommel's recommendations for improved coastal defense were welcomed by von Rundstedt and the other senior commanders who felt that the army had been too long neglected in the Atlantic Wall construction compared to the Kriegsmarine.

Rommel's intervention came at an opportune time for the fortification program. The pace of construction of the Atlantic Wall had fallen off from its highpoint in April 1943 to its lowest point in January 1944 when less than half as much construction was completed. While some of this decline was seasonal, other factors were more important. On the night of May 16/17, 1943, the RAF



This Rheinmetall 150mm SKC/28 in a coastal C/36 mount with non-standard gun-shield was one of four guns of MKB Landemer, 6./MAA 260, positioned in an M272 casemate, part of StP 230 in Castel-Vendon to the west of Cherbourg. (NARA)

had breached several of the Ruhr River dams, flooding a portion of Germany's industrial heartland and knocking out hydroelectric power generators. Speer pledged to Hitler that the Organization Todt would clean up the mess as quickly as possible, and so resources were drained out of the Atlantic Wall program through much of the summer of 1943. Hitler's new fancy in the autumn of 1943 was the forthcoming V-weapon program, and a major construction effort was begun by the Organization Todt in Normandy and the Pas-de-Calais to create launch sites for the missiles, further undermining the fortification effort. Finally, the pre-invasion Allied air campaign was aimed at crippling the French rail and road networks, and through the late winter and early spring of 1944, Organization Todt workers were diverted from fortification programs to assist in rebuilding the railroads.

To compensate for the shortages of Organization Todt construction workers, in 1944 the Wehrmacht began to assign some of the construction work to infantry divisions along the coast. Each of the infantry corps had a *Festung Pioneer Stab* (Fest.Pi.Stab: Fortification Engineer Staff) assigned to it. These were organized somewhat like a regiment with three attached battalions, but these were administrative units, not tactical formations, and their principal role was to plan and direct the construction of fortifications within their sector. In the late winter and spring of 1944, they were assigned additional troops, often Ost battalions of Soviet volunteers, to help carry out construction work. The primary work assigned to the infantry troops was to assist in creating the shoreline defenses. Since resources were very limited, most of this work involved either the transfer of obstacles from idle defensive works in occupied Europe, or the creation of improvised obstacles using local resources. Cointet obstacles, also called Belgian gates or C elements, were large steel-frame devices manufactured in the 1930s to block Belgian frontier roads. Czech hedgehogs (*Tschechenigelen*) were collected from Czech forts in the Sudetenland as were similar obstacles found elsewhere in occupied Europe. Similar obstructions were made from scrap metal and concrete including concrete tetrahedons. One of the simplest forms of anti-craft obstruction was an angled pole, often topped by a Teller mine. During his tour of the defenses in February 1944, Rommel was shown a local technique at Hardelot-Plage using fire hoses to quickly dig holes for these stakes, and this technique was widely disseminated through France.

Some of this work was too hasty and ill conceived. When some officers decided to test the effectiveness of the stakes using a British landing craft captured at Dieppe, they were shocked to find that the craft simply plowed through the obstructions with little trouble. As a result, the more substantial *Hemmbalk* (beam obstruction) was designed resembling a large tripod.

The most effective anti-craft device was a Kriegsmarine mine called the KMA (küstenmine-A: coastal mine-A), which consisted of a concrete base containing a 75kg explosive charge surmounted by a steel tripod frame with the triggering device. Although cheap and effective, they became available too late to be laid along the entire coastline. They were first laid along the Channel coast from Boulogne south towards Le Havre since this sector was considered the most likely to be invaded, and this phase was completed in early June 1944. The next area to be mined was the Seine estuary around Le Havre, which was to begin on June 10, but this never took place due to the invasion. Because of shortages of the KMA mine, the army developed cheap expedients, the most common of which was the "nutcracker" (*Nussknacker*), which consisted of a French high-explosive artillery projectile planted in a concrete base with a steel rod serving as the activating lever. Nearly 10,000 of these were manufactured and deployed in 1944.

Another change in fortification plans in early 1944 was the decision to place all field artillery of the static divisions on the coast under concrete protection, based on the lessons from the Salerno campaign. These casemates were not especially elaborate and were simple garage designs such as the H669 and H612. This program began in earnest in January 1944.

OB West was very concerned about the possibility of Allied airborne attacks, and several steps were taken to deal with this threat. Large fields near the coast were blocked with poles and other obstructions to prevent glider landings, though in practice this proved to be flimsy and ineffective. In some low-lying coastal areas such as the fields behind Utah Beach and the fields southwest of Calais, the Wehrmacht flooded the fields to complicate exit from the beach. However, many German tactical commanders were reluctant to flood valuable crop fields as local units often depended on local produce to feed their troops and this placed a limit on the extent of deliberate flooding.

Atlantic Wall beach obstacles, June 1, 1944

Army	Fifteenth	Fifteenth	Fifteenth	Seventh	Seventh	Seventh	First	First
Corps	67	47	81	84	74	24	80	86
Fest.Pi.Stab	12	27	21	11	9	17	13	28
Sector	Calais	Dieppe	Le Havre	Normandy	N. Brittany	S. Brittany	Atlantic coast	Bayonne
Coast length (km)	329.5	125.5	253.5	300.0	450.0	816.0	596.0	221.9
Coast with obstacles (km)	142.7	119.2	174.7	205.0	136.0	220.0	520.8	117.9
Concrete stakes	2,171	9,600	?	4,634	4,092	1,137	–	–
Wooden stakes	48,191	60,631	75,020	10,939	29,334	23,483	35,545	38,047
Steel stakes	10,584	21,465	9,416	?	?	1,316	–	–
Concrete tetrahedrons	1,849	5,167	4,163	4,912	1,721	25,239	15,832	3,214
Nutcracker	4,797	1,964	2,433	?	445	146	–	–
Other types	22,898	9,747	7,513	4,722	11,683	6,990	1,113	–
Belgian gates	644	6,631	4,256	2,375	3,202	3,674	933	400
Czech hedgehog	9,461	7,849	16,269	15,932	4,420	1,703	1,426	10
Curved anti-tank ramps	2	–	4,836	2,252	476	1,248	–	–
Mines (in tidal area)	14,779	15,757	20,123	6,589	10,195	6,335	2,541	–
Obstacle density per km	705	1,032	709	223	407	295	105	353

Tour of the sites

One of the most scenic gun positions on the Opal Coast is MKB Arnika (La Crèche II) of 4./MAA.240, which consisted of four H671 casemates for 105mm SKC/32 U-boat guns. Located along the edge of a cliff to the north of Boulogne, one of the four casemates has already succumbed to erosion and fallen into the sea below. (Author's collection)

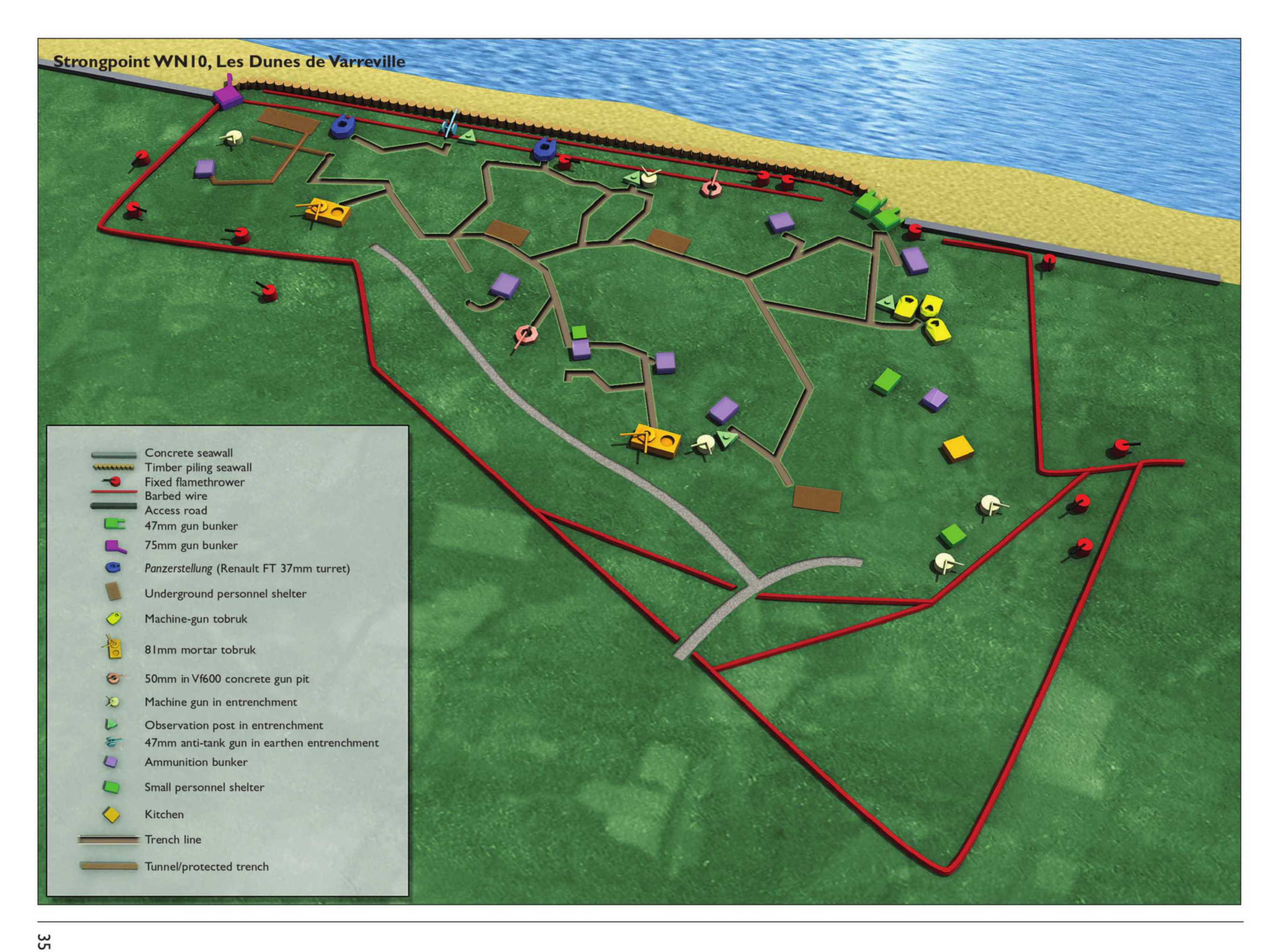
The Atlantic Wall consisted of so many strongpoints, gun batteries and other fortified positions that it is impossible in this short survey to even list them all. Instead, some typical examples of defensive positions will be described.

Naval coastal artillery

The Kriegsmarine coastal artillery batteries varied in composition depending on the type and number of guns. Some of the naval artillery regiments (*Marine-Artillerie-Abteilungen*) were composed primarily of heavy batteries. A good example of this was MAA.244 located on either side of Calais. This unit included six heavy batteries averaging three guns per battery. A typical example was MKB Oldenburg, located immediately east of Calais in Moulin Rouge. This battery was armed



OPPOSITE **Strongpoint WN10, Les Dunes de Varreville**
WN10 was a fairly typical infantry resistance nest containing a mixture of reinforced concrete bunkers and earthen entrenchments. This was one of three inter-related strongpoints manned by 4.Kompanie, Infanterie Regiment 919, 709.Infanterie Division, and located to the northwest of Utah Beach, covering an area 600m wide and 300m deep. This strongpoint was manned by a reinforced platoon of about 40 troops. It was designed to cover the beach in either direction through the use of enfilade gun casemates on either end, a 75mm H677 casemate on the northern end and a pair of Skoda 47mm 36(t) casemates on the southern end. Defenses of the position pointing seaward included a 50mm pedestal gun in a Vf600 gun pit, a French 47mm anti-tank gun in an entrenchment, and a pair of Renault FT tank turrets with 37mm guns on reinforced tobruks. The center of the position was honeycombed with trenches and there were eight machine-gun emplacements. Fire support for the forward positions came from a pair of 81mm mortars in tobruks toward the rear of the position and there was a single 50mm pedestal gun covering the rear of the site. There were numerous small bunkers serving both as ammunition and personnel shelters. Two of the ammunition shelters were reinforced concrete but only one of the larger personnel shelters was concrete; the rest were heavy log construction, buried for some added protection. There were several small observation posts that were linked to divisional artillery by means of field telephones. This strongpoint was subjected to heavy naval bombardment on D-Day. The surviving defenders offered little resistance and the position was overrun by the 3rd Battalion, 22nd Infantry Regiment, 4th Infantry Division, late on June 6, 1944. Most of the concrete structures of this strongpoint still exist. (Artwork by Chris Taylor)



Strongpoint WN10, Les Dunes de Varreville
Concrete seawall
Timber piling seawall
Fixed flamethrower
Barbed wire
Access road
47mm gun bunker
75mm gun bunker
Panzerstellung (Renault FT 37mm turret)
Underground personnel shelter
Machine-gun tobruk
81mm mortar tobruk
50mm in Vf600 concrete gun pit
Machine gun in entrenchment
Observation post in entrenchment
47mm anti-tank gun in earthen entrenchment
Ammunition bunker
Small personnel shelter
Kitchen
Trench line
Tunnel/protected trench

with a pair of 240mm SKL/50 guns, which were Czarist 254mm guns captured in 1915 and re-chambered by Krupp. Originally installed in 1940 in open gun pits as part of the Operation *Seelöwe* build-up, the batteries were substantially improved starting in 1942 with a pair of massive casemates, along with two H621 personnel shelters, a H606 searchlight stand and numerous supporting bunkers. The neighboring regiment to the west, MAA.242, had some of the most famous naval batteries including Batterie Todt. Positioned along the high ground of Cap Gris-Nez and Cap Blanc-Nez, this regiment had an extensive array of observation bunkers on the promontories, as well as radar surveillance stations. These two regiments constituted the densest and most powerful assortment of naval coastal batteries on the Atlantic Wall. This heavy concentration was in part due to the strategic decision to heavily fortify the Pas-de-Calais but the batteries also served to interdict Allied shipping in the Channel.

Most of the other major *Festung* ports had a similar concentration of naval artillery, though often of less imposing size. A typical battery was MKB Vasouy, the 9.Batterie of Marine-Artillerie-Abteilung 266 (9./MAA.266) located along the south bank of the Seine River opposite Le Havre on the outskirts of Honfleur. The battery's mission was to cover the mouth of the Seine River. Its basic armament consisted of four 150mm Tbts.K.L/45 guns, essentially a coastal version of the standard 150mm destroyer gun with an effective range of 18km and a rate of fire of 1.5 rounds per minute. These were enclosed in four M272 *Geschützschartenstand* (gun casemates) arranged in a line a few hundred meters from the river's edge. This type of casemate was fairly typical of Kriegsmarine designs but not especially common in France, with only six along the Channel coast and 21 elsewhere including Norway, Denmark and the Netherlands. This particular type of casemate was first built in April 1943 and required 760m^3 of concrete. The guns were directed from a M262 *Leitstand für leichte Seezielbatterie* (fire-control bunker for light naval battery) located on a rise on the left of the battery position, connected to each of the four gun casemates by buried electrical cable. Although typical of Kriegsmarine fire-control bunkers, it was not a particularly common type, with only four on the French Channel coast and ten more in the Netherlands. Like most naval fire-control bunkers, it was two stories with an observation post in the lower level, and an optical rangefinder post on the upper level. Inside the bunker was a control room where the target was plotted and the aiming data sent to the gun casemates. The battery had a



The St. Chamond 155mm K420(f) gun was adapted for coastal defense with a special armored mount to fully enclose the embrasure. This example is mounted in an H679 casemate of MKB Gatteville of 7./HKAR.1261 near Cherbourg. (NARA)



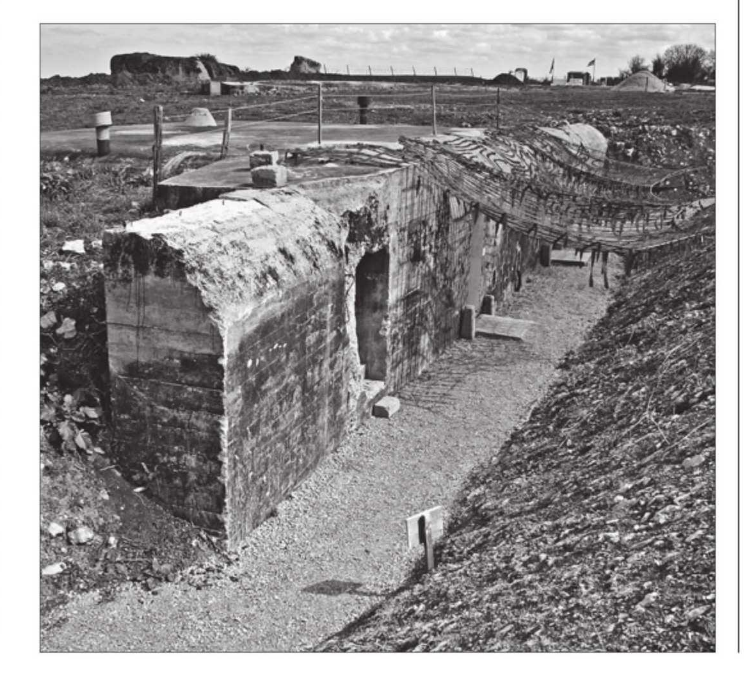
Tobruks were also used to form the basis for *Panzerstellungen* using surplus tank turrets like this French APX-R turret with 37mm gun being used in the strongpoint at St. Marcouf-les-Gougins on the Cotentin coast north of Utah Beach. (NARA)

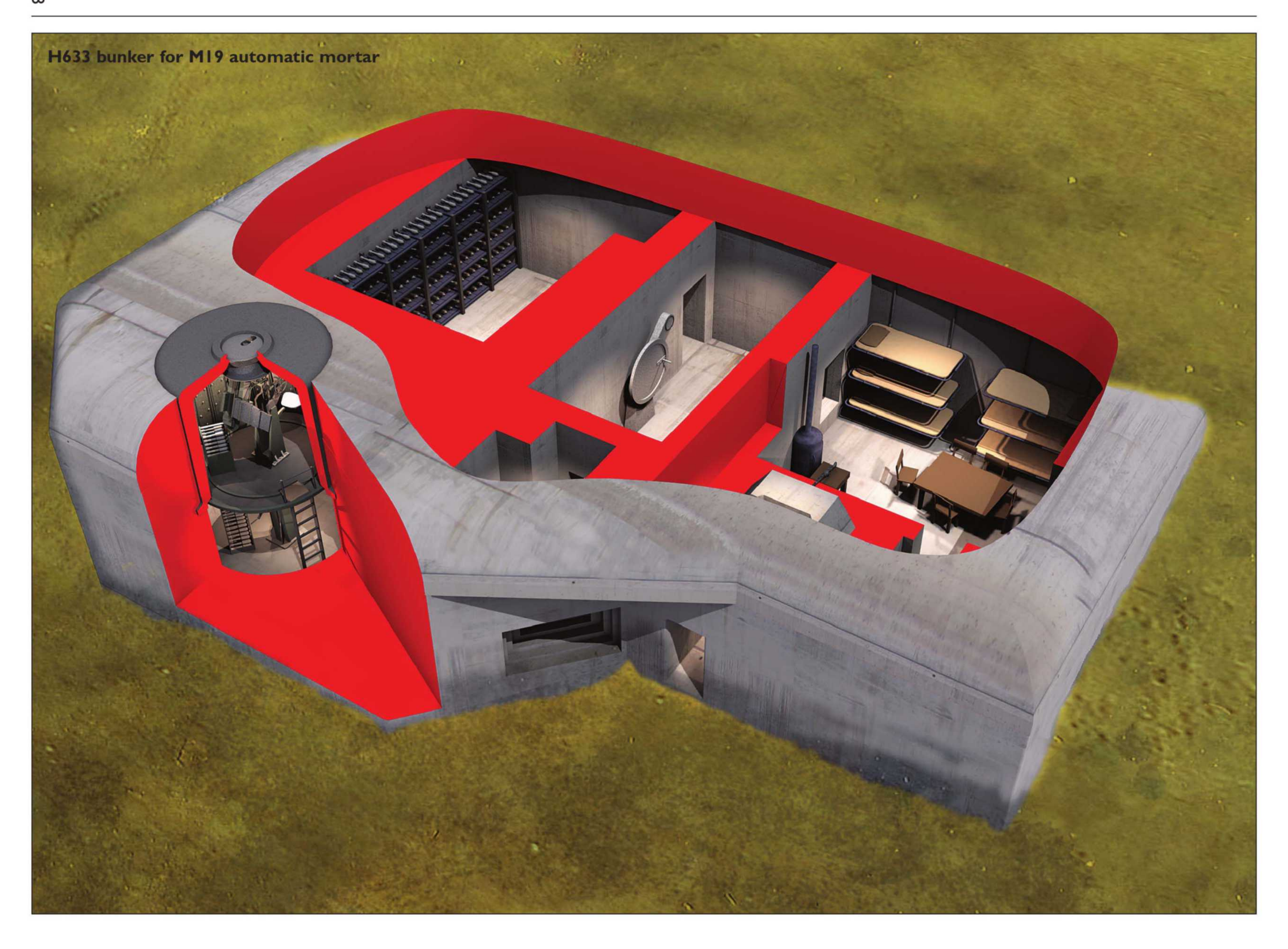
single munitions bunker on the other end of the battery site, and two personnel bunkers immediately behind the gun casemates. In 1944, the battery was entirely surrounded by barbed wire, and there were four tobruks armed with machine guns for site defense.

Army coastal artillery

Fortified army coastal artillery batteries came in three main varieties, the dedicated army coastal artillery regiments (HKAA/HKAR: *Heeres-Küsten-Artillerie-Abteilung/-Regiment*) deployed in 1942–44, the fortified divisional artillery battalions, and the railroad artillery batteries. The army coastal artillery regiments could be found along many sections of the coast but they were not evenly spread. So for example, naval batteries dominated the Pas-de-Calais, while army batteries dominated lower Normandy, including HKAR.1260 located along the D-Day beaches and HKAR.1261 on the eastern Cotentin coast to the southeast of Cherbourg. Some of the batteries in these regiments were originally naval batteries such as 3./HKAR.1261 in St. Marcouf and 4./HKAA.1260 at Longues-sur-Mer, which were absorbed into the army regiments in 1943 to create a unified command. The most extensive of these was HKAR.1261, which had ten batteries stretching from St. Martin-de-Varreville near Utah Beach along the Contentin coast to La Pernelle on the outskirts of Cherbourg. In general, these batteries were not as well equipped to deal with moving naval targets as the naval batteries, lacking radars or plotting rooms in their forward observation bunkers. This regiment had some of the best of the army gun casemates, usually including at least partial armored shields for the guns. For example, its 7.Batterie located in Gatteville in H679 casemates had their 155mm K420(f) guns behind a traversable armored shield that completely covered the embrasure; the 2.Batterie in Azeville had lighter 105mm K331(f) guns, and these had an armored shield which partially covered the embrasure. These dedicated coastal batteries tended to have an extensive array of support bunkers, including personnel shelters and ammunition bunkers.

Most major coastal batteries included personnel and munitions bunkers. MKB St. Marcouf of 3./HKAR 1261 near the Cotentin coast had several shelters including this H622, a very common type in France with over a thousand built, including the related H502 type. Although built originally as a naval battery, it was subordinated to an army artillery regiment. (Author's collection)





H633 bunker for M19 automatic mortar



Tobruks were generally buried since their protection was only B1 standards, 1.5m thick or less. Usually the tobruk included a small room for ammunition storage and crew shelter, which was usually accessed through a small door, requiring an adjacent trench. (Author's collection)

In contrast to the dedicated coastal artillery batteries, the fortified divisional artillery batteries tended to have simpler garage casemates without specialized armored protection for the embrasure since their weapons were towed field artillery pieces. Supporting bunkers were often less extensive due to the relatively late date of construction of many of these sites, which did not begin in earnest until January 1944. The degree of fortification was quite uneven so for example, the famous Merville Battery attacked by British paratroopers on D-Day had a selection of bunkers comparable to that of dedicated coastal artillery batteries due to the early date of its fortification. Many divisional artillery battalions were not fortified at the time of the D-Day landings.

The army's railroad artillery batteries fell out of favor after the 1940 bombardment campaign as rail-guns were withdrawn to other theaters. The *Dombunker* construction program was not extended beyond the Pas-de-Calais, and the remaining railroad gun batteries such as those on the Cotentin Pensinsula near Cherbourg did not have dedicated bombproof shelters.

OPPOSITE **H633 bunker for M19 automatic mortar**

The H633 *Kampfstand für M19 Maschinengranatwerfer* was an example of the influence of the earlier Westwall fortification program. This weapon was specifically developed for the Westwall but by the time that production began in 1940, the requirement had ended. Instead, most were eventually used on the Atlantic Wall, and some 79 were installed in the H633 and H135 bunkers, with 48 on the French coast. The first was completed in April 1942 and construction required 845m^3 of concrete, 40 tonnes of steel rebar and 6.3 tonnes of other steel items. The bunker was usually manned by a crew of 14 and living accommodation was provided opposite the fighting compartment. The entryway was protected by an armored machine-gun embrasure and led to the usual gas lock prior to access to the living quarters. In the center of the bunker was a small room containing the ventilation equipment as well as the defensive machine-gun position. The mortar itself was located under an armored cupola and consisted of a two-floor assembly with the mortar in the upper chamber and an automated ammunition system below. Behind the mortar chamber was an ammunition room and the bunker typically stored 3,944 50mm mortar bombs stowed on special six-round clips. The mortar was crewed by two soldiers, a gunner and loader, while the other soldiers in the bunker helped supply the ammunition or served on guard duty. The M19 automatic mortar fired at a maximum rate of 120 rounds per minute and had a range of 50 to 750m.

Like most bunkers of this period, it was constructed to Standard B with walls 2m thick. Ideally, the bunker was supposed to be buried flush to the ground with access to the entryway via a trench. Along the coast, it was sometimes built with the back wall into a dune facing the sea, with the rest of the bunker exposed. In this case, the entryway was usually protected by a berm or a concrete wall to prevent direct fire against the door. Only one of these bunkers was located near the D-Day beaches, north of Utah Beach, but they were more common on the Pas-de-Calais, with at least one still surviving, although largely buried, near Oye-Plage. (Artwork by Chris Taylor)

The Vf600 gun pits were one of the most common defensive positions along the Atlantic Wall, in this case armed with a 50mm pedestal gun. These guns were an adaptation of obsolete 50mm tank guns on a simple pedestal mounting with a gun-shield for crew protection. This one in the outer ring of Cherbourg defenses has an umbrella cover overhead for camouflage and weather protection, a common improvisation. (NARA)



Army infantry strongpoints

Infantry platoon and company strongpoints followed no particular pattern and tended to be constructed on the basis of available concrete supplies, available fortification weapons, and the terrain features of the coast where they were located.

In general, the infantry fortifications on the Atlantic Wall were not as comprehensive as those on the Westwall built along the German frontier in 1938–40. There were two reasons for this, the first of which was the lack of time and supplies to complete any comprehensive fortification of the entire French coastline. The second reason was tactical. Von Rundstedt and many German commanders were leery of extensive infantry fortification, as they feared it would lead to rigid tactics based around fixed sites. The commanders did not want the infantry cowering in their bunkers while the Allies flowed past the



A good example of a Vf600E gun pit for the widely used pedestal-mounted 50mm anti-craft gun, seen here in a strongpoint near Grand Vey near of the mouth of the Vire River in lower Normandy. A version of this gun pit was also used for other small crew-served weapons, such as the 20mm Flak 30 and Flak 38 anti-aircraft guns. (NARA)

defenses, but expected them to get out of the bunkers when necessary and use conventional infantry tactics. As a result, OB West favored the use of a generous number of fortified machine-gun, mortar and anti-tank positions, but most of the infantry would fight from normal slit trenches. Personnel bunkers were provided for shelter during naval bombardment, but not for fighting.

The 4.Kompanie of Infanterie Regiment 919, 709.Infanterie Division, provides an example. This company was deployed along the Cotentin coast from St. Martin-de-Varreville to Ravenoville, a distance about 4km wide. This sector was a few kilometers to the north of Utah Beach on D-Day. Since German tactical doctrine recommended that a company defend a sector 400 to 1,000m wide, this sector was about four to ten times wider than would be assigned to an unfortified company in normal field conditions.

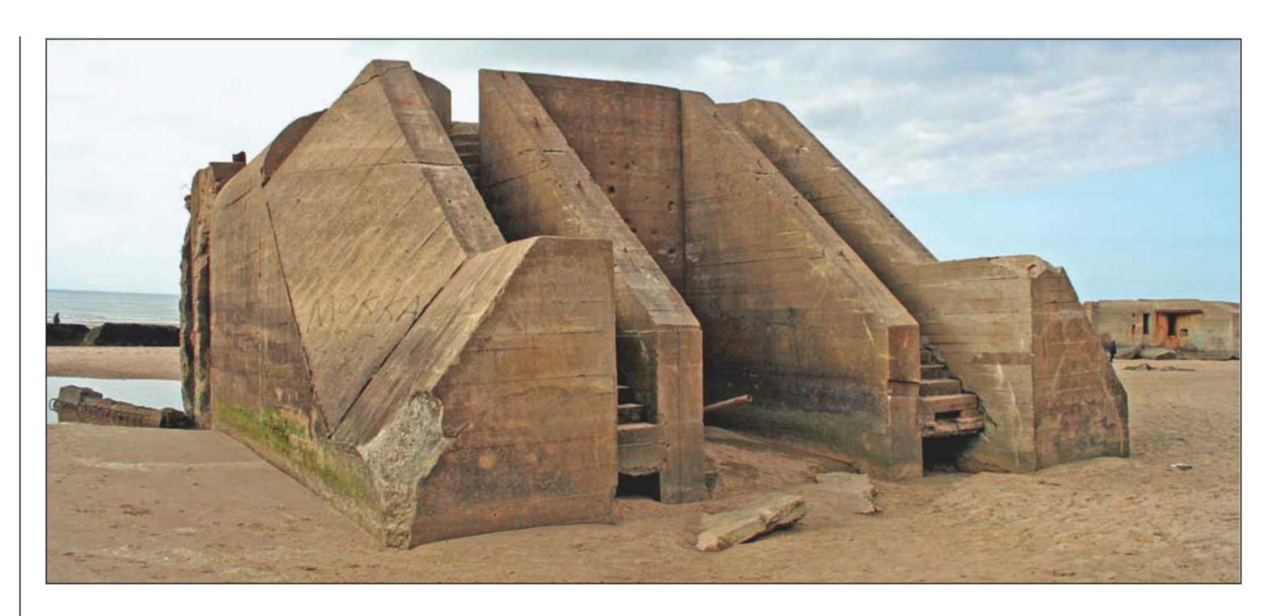
This company was commanded by Oberleutnant Werner, numbered about 170 men and deployed in three strongpoints, WN10, WN11 and StP 12. Of the three strongpoints, WN10 on the right flank was by far the largest and most amply equipped and it is shown in more detail on illustration on page 35.

The WN11 strongpoint in the center was primarily the company headquarters. It had minefields on either side and its principal bunkers facing the beach included two tobruks with 37mm French tank turrets, an artillery observation bunker, two machine-gun entrenchments and a 50mm gun in a Vf600 gun pit. Bunkers within the strongpoint included a mortar and a machine-gun tobruk, and five personnel and munitions bunkers. The northernmost strongpoint, StP 12, was small but heavily fortified and included four tobruks with 37mm French tank turrets, a H612 enfilade casement with 75mm gun, a modified H677 casemate with 50mm gun and a large H644 observation bunker with armored cupola.

As can be seen from this description, several types of bunkers were very common in these infantry strongpoints. By far the most common were the tobruks, which were not a single type of bunker but rather a generic term for a wide range of small defensive works characterized by a small circular fighting position, hence their official designation as *Ringstand*. They received their popular name from a type of Italian defensive position used during the Tobruk fighting in 1942 which had been constructed from a length of circular cement pipe buried vertically in the sand to create a protected firing pit. The German version was more elaborate since it generally included one or more compartments for the protection of the crew and for ammunition stowage. They were most often used

Besides its use in Vf600 open gun pits, the 50mm pedestal gun was also located in enfilade casements such as this H667, part of the St. Marcouf-les-Gougins strongpoint. (NARA)





One of the more elaborate mounts for the 50mm pedestal gun was the R600, which had the usual hexagonal gun pit on the top of the structure, but included an alert room and ammunition storage in a chamber below. Normally, this casemate would have been buried in the edge of a coastal dune, but this example on the beach at Wissant has been left stranded by coastal erosion since the war, exposing its interesting shape, including the pair of rear stairways to the gun pit above. (Author's collection)

to create a machine-gun position, but another common variant was a variety of mortar pit for either the battalion 81mm mortars, or company 50mm mortars. A third common application was to mount the turret from French Renault FT, Renault R-35 or Hotchkiss H39 tanks on the tobruk, all armed with a version of the short 37mm tank gun.

Another widely used fighting position was the Vf600 gun pit, typically fit with the 50mm anti-craft gun. This was a six-sided open concrete emplacement with semi-protected cavities for ammunition stowage around its inner perimeter. The 50mm anti-craft gun was an adaptation of the obsolete 50mm tank gun mounted on a simple pedestal with a shield added for crew protection. Both the short (KwK 38) and long (KwK 39) versions of the gun were used and a number of these guns were re-bored to fire 75mm ammunition. An interesting hybrid of the tobruk and Vf600 was the *Michelmannstand*, developed by Col. Kurt Michelmann, the commander of Festungs Pioneer Stab 27 responsible for fortifying Dieppe and upper Normandy. This was a prefabricated reinforced concrete machine-gun pit that could be rapidly emplaced on beaches or other areas in lieu of more conventional and time-consuming construction techniques. Although it resembled a shrunken Vf600, its tactical application was closer to that of a tobruk.



One of the most effective tactical beach defense bunkers was the H677 enfilade casemate for the 88mm PaK 43/41 anti-tank gun. This could control 3km or more of coastline and 116 were built along the Atlantic Wall in France. This shows the interior of one located in the Varreville strongpoint north of Utah Beach. (NARA)

The living sites

The Atlantic Wall was manned by a variety of troops depending upon type of site and the branch of service. The army was the predominant branch responsible for army coastal artillery sites as well as the numerous smaller strongpoints. The Kreigsmarine was responsible for the navy coastal gun sites as well as supporting sites such as naval surveillance radars. The Luftwaffe was by far the smallest of the three services represented on the Atlantic Wall, taking care of coastal air surveillance radar sites as well as some Flak sites located close to the coast; there were some Luftwaffe field divisions along the Atlantic Wall, but their experiences were essentially the same as those of comparable army infantry divisions.

The army sites were manned by infantry divisions and not specialized fortress troops. There were two principal types of infantry divisions along the coast, static divisions and a smaller number of regular infantry divisions. The static divisions as their name implies were intended for positional defense and lacked the usual assortment of vehicular transport. The personnel in the static divisions were drawn from the bottom on the manpower reserves, typically older men, those with medical problems, and troops recovering from wounds suffered in Russia. The manpower situation became so bad in early 1943 that OB West was forced to adopt a policy of "dilution" of the static divisions under which each of the infantry regiments along the Atlantic Wall would have one *Ost* (East) battalion substituted for a German battalion in each regiment. The *Ost* battalions were made up of Soviet prisoners-of-war who "volunteered" for the Wehrmacht rather than starve to death in the camps. By the summer of 1943, the coastal defense divisions were combed out of their best troops, who were sent to the Russian Front. Even in the case of the nominally German battalions, the quality of troops continued to deteriorate with the growing

Some of the coastal batteries were barely completed before D-Day so there was not enough time to cover the sides with earth. This H650 casemate, armed with a 105mm K331(f) gun, was part of HKB Crasville of 5./HKAR.1261 on the Cotentin Peninsula near Videcosville. The rest of the battery used the smaller H671 casemates that lacked the rear ammunition rooms and crew accommodation. (NARA)



induction of *Volksdeutsche* from eastern Europe—ethnic Germans who in many cases could not even speak German, as well as Poles drafted from the western Polish provinces incorporated into the Reich after 1939.

The daily routine for these troops was essentially the same as for other army troops on occupation duty in France with the usual pattern of reveille, inspection, tactical training and guard duty. As the possibility of an Allied invasion increased, tactical exercises became more common, especially surprise alerts and anti-paratrooper field exercises. For most troops, assignment to France was a relief compared to a posting on the Russian Front. Conditions in France varied considerably through the war, with troops assigned to the defenses in 1941–42 recalling ample food and relaxed work conditions, while troops assigned in the autumn of 1943 and early 1944 recalling the general scarcity of food and the increased amount of both training and construction work. The static divisions assigned to coastal defense were poorly equipped with vehicles and could barely manage to transport their own supplies. Fuel shortages after 1942 greatly restricted travel even by officers, and so troops often used horses or bicycles for routine transport.

Prior to D-Day, the coastal defenses were usually at a routine alert level. For a typical infantry division, only about a third of its troops were actually assigned positions in the coastal defenses, with the artillery and support personnel stationed away from the coast. In theory, all troops assigned to the coastal defenses were supposed to be permanently stationed within the strongpoints. In reality, most of the sites except for high-priority areas such as Pas-de-Calais were far behind schedule in constructing sufficient personnel bunkers for the entire garrison. As a result, troops in the infantry battalions allotted to the coast defenses were often garrisoned a short distance from the strongpoints depending on the availability of houses or public buildings that had been requisitioned for

The French Schneider 105mm K331(f) gun was used with at least 37 batteries in the Atlantic Wall defenses in a modified version with a partial armored shield to help cover the embrasure opening. This example is in an H650 casemate, part of HKB Azeville of 2./HKAR 1261, on the Cotentin Peninsula. (NARA)





This 75mm enfilade casemate on the Cotentin coast north of Utah Beach has been camouflaged to resemble a house by erecting a false roof over the structure. This particular casemate was built into an anti-tank wall built to prevent easy access off the relatively flat beach, a common type of obstacle on the Atlantic Wall. (NARA)

barracks. Only a portion of the infantry battalions were assigned to guard duty along the coast at any one time. A typical platoon strongpoint (*Wiederstandnest*), which would be allotted about 30–40 troops at full alert, would typically have personnel bunkers to accommodate only about half this force, or about 20 men, on a routine basis for guard duties. These personnel bunkers were cramped, poorly ventilated, cold and dank. As the possibility for the Allied invasion increased, alerts increased as well. After April 1944, strongpoints tended to be manned at higher levels and, by late May 1944, most strongpoints along the English Channel were on full alert.

In general, the strongpoints were guarded from the defensive positions since they were positioned to overlook the beach. Foot patrols would be conducted at night, but in a restricted pattern due to the extensive use of minefields. In the strongpoints, officers were supposed to dress according to combat conditions, meaning no distinctive insignia or accoutrements such as map cases; in practice this was often ignored until alerts were issued in the spring of 1944.

The work routine changed abruptly in early 1944 due to the need to accelerate construction, Rommel's insistence on additional shore defenses and the growing difficulty of obtaining labor to conduct construction projects. As a result, most infantry divisions were assigned to conduct their own construction work, usually at the expense of tactical training. Memoirs by German troops from this period recall grueling days of work along the coast implanting beach obstacles, digging trenches, assisting in construction work and improving site camouflage. As mentioned earlier, in 1943 the static divisions underwent a dilution program, substituting roughly one battalion in three with Ost battalions of Soviet prisoners-of-war. In practice, most German commanders were skeptical of the combat value of these troops and, where possible, the battalions were spread out among German units to ensure their dependability.

Army coastal artillery battalions were generally recruited from older age classes not suitable for front-line service and the officers were usually former reserve officers from World War I recalled to duty. These units devoted more time to training than in typical infantry units assigned to coast defense since the rule was that personnel had to be familiar with at least two types of artillery piece. In addition, redundant training was also standard, for example infantry training for guard duty and site defense combined with training as a signals



R621 *Gruppenstand*



The R621 personnel bunker has a tobruk machine-gun pit on one side for observation and defense. This particular type of bunker was the most common type along the Atlantic Wall in France with over 1,000 built including the related R501. This one is part of StP Düsseldorf on the eastern slope of Cap Blanc-Nez, overlooking Sangatte and the Eurotunnel to the right. (Author's collection)

OPPOSITE **R621 *Gruppenstand***

The R621 personnel bunker was the single most common type of bunker on the Atlantic Wall with over 1,000 built along the French coast along with the related R501 type. The R621 was designed for a single "group," meaning 10 soldiers. Construction of this type began in January 1943 and each example required 485m^3 of concrete, 23 tonnes of steel reinforcing bar and 3.7 tonnes of other steel. The design was Standard B with walls 2m thick. On flat ground, the bunker was buried flush with the ground, with access to the front entryways via a trench in front of the bunker. Along the coast, it was a common practice to build the bunker into the reverse side of coastal dunes with the front away from the sea. In such a case, a berm or wall was constructed to protect the doors from direct fire. Like most German personnel shelters, the R621 was designed to be gas-proof with a closed ventilation system and associated filters.

Access to the bunker was through a pair of entryways, each guarded by a firing slit from the interior chamber. The entryways both led through armored doors into a center gas lock intended for the soldiers to decontaminate themselves before entering the main room through another armored door. The main room was rather small, 5.8 by 3.5m, and contained three rows of suspended cots three high along the rear wall. Accommodation was spartan, usually a table and chair in the center, a small wood stove, and some form of storage for the troop's weapons and equipment. The R621 usually included a tobruk firing pit at one end with access from the exterior. There were a number of modifications of this design including the R621a with a pair of tobruk firing pits on either end. The R621 was part of a family of similar personnel shelters, the related R622 *Doppelgruppenstand* being nearly identical in appearance except that it was large enough for two adjacent rooms to accommodate two groups (20 men). The R621 can be distinguished from the R622 in that it usually had four circular ventilation covers between the two entryways while the R622 had six. These two types of bunkers made up nearly a third of all bombproof fortifications built for the army along the Atlantic Wall. (Artwork by Chris Taylor)



The perspective of a German soldier manning an observation bunker facing an Atlantic beach from a bunker in the Fifteenth Army east of Dunkirk. The beach obstacles are a mixture of wooden *Hemmbalk* and tetrahedrons. (NAC P116749 Ken Bell)

operator; forward observer training as well as unit supply clerk training. This was done both to allow the unit to function even in the event of combat casualties and because the coastal batteries tended to operate below normal tables with minimal personnel.

In general, the naval coastal batteries enjoyed a somewhat better personnel situation than the army, especially in the years prior to 1943. However, the Kriegsmarine was subjected to the same personnel difficulties after 1943 and, as a result, the average age of the gunnery personnel along the Atlantic Wall continued to increase. In addition, personnel shortages led to the imposition of emergency war strength tables to the batteries, meaning ten percent under the nominal tables. While this didn't adversely affect the gun teams, it reduced the ability of the coastal batteries to conduct site defense and frequently forced the navy gun batteries to ask for the assistance of neighboring army units to help conduct defense of the battery strongpoints. As a result, some naval coastal battery strongpoints had a mixture of navy and army personnel. In spite of these problems, the coastal batteries tended to have far better troops than other naval defense units along the Atlantic Wall such as the harbor companies, alarm companies or marine battalions. The naval coastal batteries had higher priority than many army defenses on the Atlantic Wall and so tended to have a more complete complement of personnel bunkers, adequate to house the entire battery. Each battery had a strength of 60–90 troops depending on the type and number of guns.

Although the coastal artillery batteries tended to have more elaborate personnel bunkers and shelters, they also had more need for these defenses. In April 1944, Allied bombers began a systematic campaign against the coastal batteries facing the Channel. The personnel bunkers could generally withstand a direct hit by most bombs, and in reality a heavy air raid on a battery would generally result in only one or two hits on any of the structures. German engineer documents record a few instances of failures of bunkers to air attack, generally due to construction faults. Whether the bunkers were penetrated or not, the bombing campaigns were a frightening prospect for the troops huddled within. While the attacks did not cause heavy casualties among the gun crews, they often compromised the effectiveness of the batteries by ripping up vital communication wires between the fire-control bunkers and the gun casemates, obstructed the gun embrasures with craters and dirt, and tore up communication trenches between the bunkers.

The sites at war

The gun batteries along the Pas-de-Calais took part in a desultory campaign of bombardment against the English coast around Dover starting in 1940 and continuing well into 1944. This resulted in a continuing campaign of counter-bombardment from British batteries as well as a prolonged air campaign against the "Iron Coast" gun batteries. Although the air campaign was not especially effective in disabling the fortified casemates, the battery sites soon took on the appearance of a lunar landscape due to the many bomb craters. There was also some exchange of fire between coastal batteries and British warships over the years and the heavy gun batteries along the Pas-de-Calais frequently fired upon coastal shipping in the Channel.

The Allied campaign against the coastal batteries was intensified in 1944 and extended to upper and lower Normandy and parts of Brittany in April 1944 as part of the run-up to the D-Day invasion. The campaign was intentionally conducted also at sites other than the D-Day beaches to keep the Wehrmacht guessing where the actual landings would take place. The bombardment campaign had very mixed results, in some cases effectively neutralizing some batteries such as the army coastal battery on Pointe-du-Hoc, in other cases failing to have any appreciable effect on the battery such as at Merville, while in other cases having mixed success such as Longues-sur-Mer, where the gun casemates were intact but their performance degraded due to the destruction of the cabling between the fire-control post and the guns.

The D-Day landings in lower Normandy on June 6, 1944, quickly overwhelmed the defenses. The coastal batteries with very few exceptions had been disabled before the landings and, even in the case of the few batteries that engaged the landing fleet such as the St. Marcouf, Azeville and Longues-sur-Mer batteries, they



The Czechoslovak 47mm Festungspak 36(t) was so widely used in the Atlantic Wall that several standardized bunker designs were developed to accommodate it. This shows the interior of one in the Cherbourg defenses. (NARA)



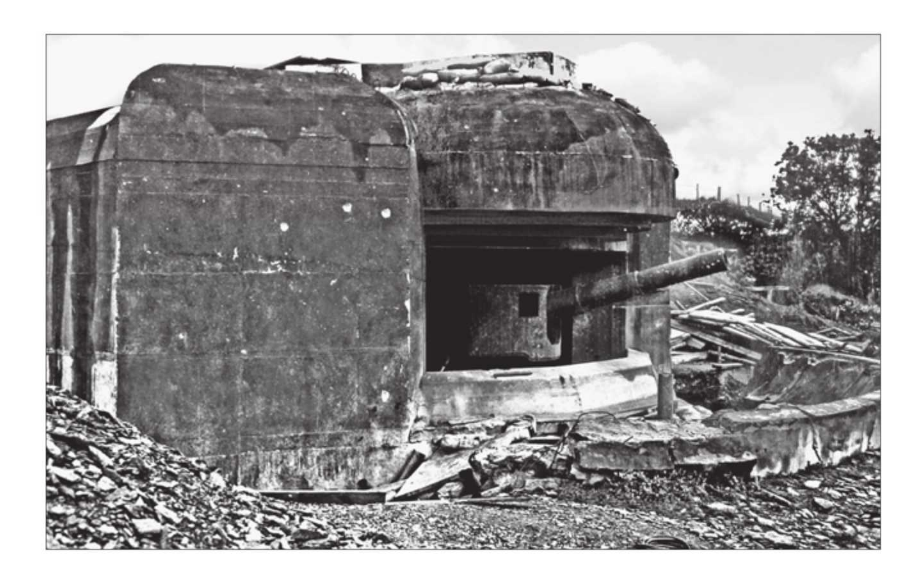
One of the problems of the coastal gun casemates was that they prevented full traverse. During the fighting for Cherbourg, MKB Hamburg removed portions of the incomplete casemate to permit a wider arc of fire for its 240mm gun. (NARA)

were quickly suppressed. The only defenses that posed a significant problem were those at Omaha Beach, and this was due primarily to the presence of more defenses, more and better troops, and a more challenging defense configuration due to the bluffs along the beach compared to the other D-Day beaches.[1]

Once the D-Day landings took place, there was no immediate evacuation or weakening of other portions of the Atlantic Wall since senior German commanders remained convinced for several weeks that the Normandy landings were only a feint and that other landings would occur elsewhere along the coast. Elements of the Atlantic Wall defenses were involved in continual combat through June as the US First Army advanced up the Cotentin Peninsula, culminating in the VII Corps attack on Cherbourg in late June 1944. Although Cherbourg had been ringed with defenses as part of the *Festung* policy, in reality these defenses were not adequate to stop the US Army. The outer crust of Cherbourg defenses served to delay the US advance, but they were comprehensively breached within a few days of intense combat. The defenses in Cherbourg itself were mostly oriented seaward and so played little role in the city fighting. Indeed, the traditional French fortified defenses around the port played as much a role in the defense as did the newer Atlantic Wall defenses, such as Fort Roule in the center of the city and the fortified harbor. The heaviest fortifications, such as the numerous navy coastal artillery batteries, played little or no role in the fighting since their ferro-concrete carapace limited the traverse of their guns to seaward targets. This experience would be repeated in the subsequent battles for the Channel ports, where most of the work on the Atlantic Wall fortifications proved to be in vain due to this fatal shortcoming.

Further fighting ensued along the Atlantic Wall after the breakout from Normandy in late July that unleashed the Allied advance along the coast toward the Pas-de-Calais and toward Brittany. St. Malo at the junction between lower Normandy and Brittany was the scene of an intense urban battle made all the more difficult for the US Army by the traditional walled fortifications of the port. The assault on St. Malo by the 83rd Division began on August 5 and took nearly two weeks of fighting, finally being overwhelmed on August 17. Even then, German defenders held out on the offshore fortifications of Cézembre until September 2. The port of Brest was one of the most heavily fortified along the Atlantic Wall and US armored spearheads began probing its defenses on August 7. The city was gradually surrounded and a full-blooded attack began on August 25 by VIII Corps of Patton's Third Army. Although the fortifications and gun

[1] For more detail, see Fortress 37: *D-Day Fortifications in Normandy* (Osprey Publishing Ltd: Oxford, 2005)



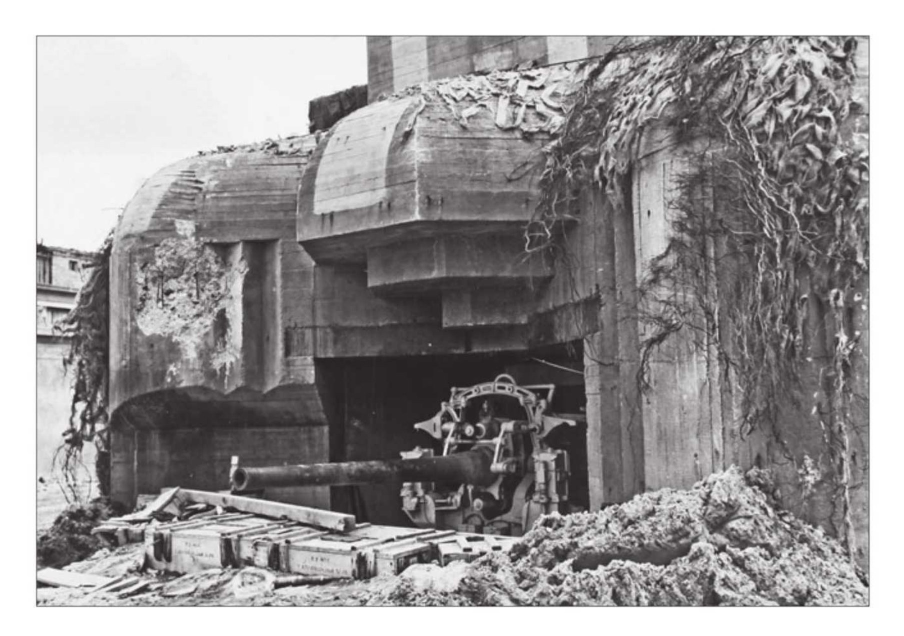
One of the M271 casemates for a 170mm SKL/40 gun of MKB York near Amfreville on the coast west of Cherbourg. (NARA)

positions of the Atlantic Wall defenses played some role in the defense of Brest, for the most part they were not especially useful for the defenders except in some limited sectors. Once again, traditional French fortifications such as Fort Montbarey and Fort de Portzic proved more troublesome than the newer and much smaller Atlantic Wall bunkers, most of which were oriented seaward. As in the case of Cherbourg, the German garrison was eventually overwhelmed, but in the interim, the Kriegsmarine managed to demolish the harbor facilities. As a result, the US Army decided against a direct assault on St. Nazaire or Lorient, preferring to simply bottle up the German garrison rather than sacrifice large numbers of infantrymen for a shattered port. The same would be the case along the Bay of Biscay, with fortified ports such as Royan and La Rochelle holding out until May 1945. To reduce the number of US troops assigned to this siege, in the autumn of 1944 newly raised French units were gradually assigned this mission.

This is the third casemate of MKB Hamburg, 9./MAA.260, in Fermanville east of Cherbourg armed with a Krupp 240mm SKL/40. The battery commander, Oberleutnant Rudi Gelbhaar, was awarded the Knight's Cross in June 1944 for the battery's engagements with Allied warships. (NARA)

Operation *Astonia*: Festung Le Havre

While the US Army was dealing with the fortified ports in Brittany, Montgomery's 21st Army Group was advancing northward toward upper Normandy, the Picardy coast and, eventually, the Pas-de-Calais. The honor of taking Dieppe was given to the Canadian 2nd Division and the city fell without a major fight on September 1. The second major port in Normandy, Le Havre, was invested by the British I Corps starting on September 3. To soften up the defenses before the ground attack, the Royal Navy monitor HMS *Erebus* began bombardment along the coast on September 5, but was forced to withdraw by the heavy concentration of coastal artillery west of the city. These positions included the only heavy gun battery in the city, a 380mm turreted gun from the French warship *Jean-Bart* located at Clos de Ronces and supported by the Goldbrunner battery of 3./HKAR.1254 with three 170mm K18 guns, two of which were in H688 casemates. Besides these batteries, there were several other batteries in the



The 105mm Unterseeboot Torpedoboot Flak L/45 was a U-boat deck gun adapted to coastal defense and is seen here with 3./MAA.260 in one of two casemates located at the end of the pier at the Gare Maritime in Cherbourg. (NARA)



Some bunkers were camouflaged to blend into their surroundings like this observation bunker along the seawall in Le Havre. (NARA)

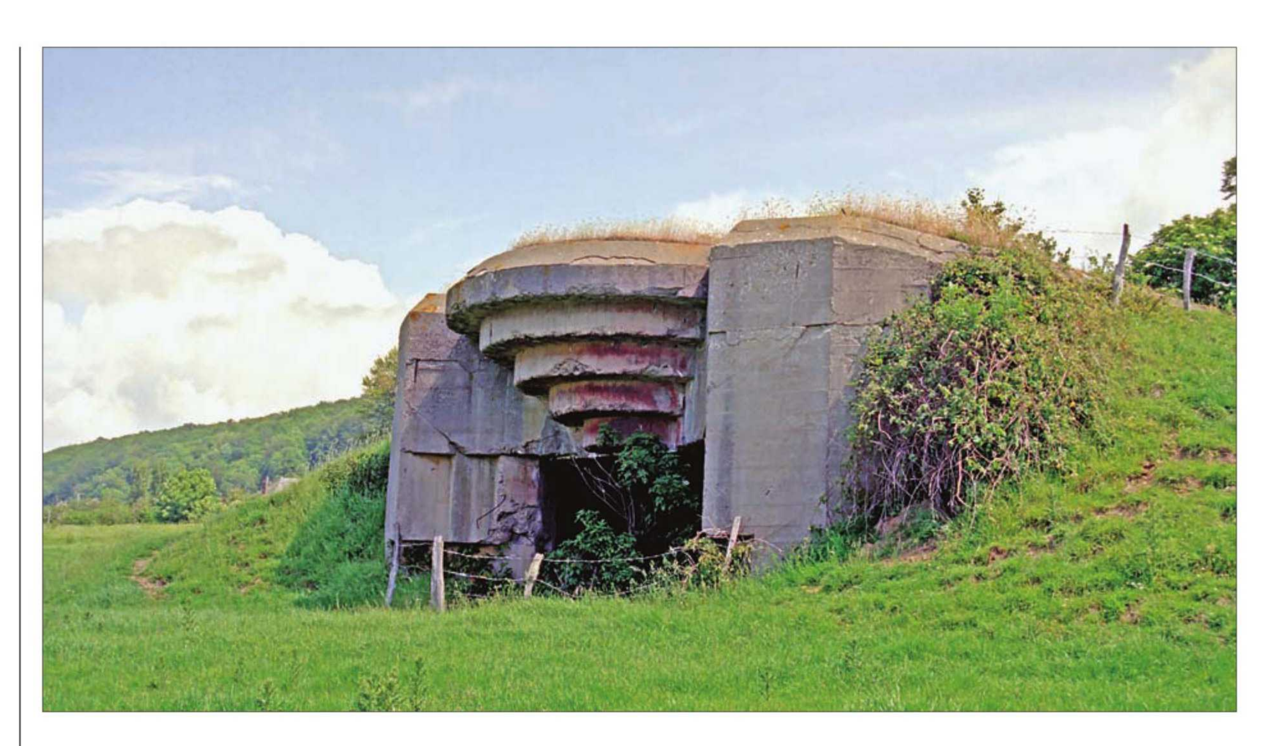


This is Bruno, one of three gun casemates of MKB Friedrich August of 2./MAA.240 in La Trésorerie, armed with a massive 305mm SKL/50 gun. It was captured by the Canadian North Shore Regiment during Operation *Wellhit*. (NAC PA-174409 Donald Grant)

immediate vicinity that took part in some of the subsequent engagements. The *Erebus* returned on September 8, but was again forced back by heavy gunfire from the German coastal batteries. Prior to the start of I Corps' main attack, Operation *Astonia*, on September 10, the *Erebus* returned but was accompanied by the battleship HMS *Warspite*, which demolished the offending batteries with its 15in. guns. The two ships then conducted a six-hour bombardment against other coastal fortifications and defenses. The battle for Le Havre by two infantry divisions supported by the specialized armor of the 79th Armoured Division lasted only two days in no small measure due to the demoralization of the isolated garrison.

Operation *Wellhit*: Festung Boulogne

While Operation *Astonia* was under way, Canadian forces had begun to probe the outer defenses of both Boulogne and Calais. The Canadian 3rd Infantry Division was assigned Operation *Wellhit*, the assault against Boulogne and the associated German fortifications in the neighboring hills. In light of the experiences at Le Havre, the specialized armor of the 79th Armoured Division was also used to support the Canadians, especially Churchill Crocodile flamethrower tanks and Churchill AVRE (Armoured Vehicle Royal Engineer) fitted with heavy petards. Festung Boulogne had three major concentrations of fortifications: a trio of coastal batteries near Pointe de la Crèche on the coast north of the city, a set of defensive bunkers and a gun battery from 4./AR.147 on Mont Lambert on the main road into the city from the east, and a series of coastal guns and bunkers on the heights to the south of the port around Le Portel. Besides the defenses of the city itself, Operation *Wellhit* also contained a subsidiary attack on German positions around La Trésorerie overlooking the city to the northeast, which contained the substantial naval battery of Batterie Friedrich August of MAA.240 with three 305mm SKL/50 guns in massive casemates. Operation *Wellhit* began on September 17, including an attack by the North Shore Regiment on La Trésorerie and two brigades assaulting toward Mont Lambert. Mont Lambert was not overcome until September 18 after engineers had blasted the final bunkers with explosive charges. The gun casemates of Batterie Friedrich August were stubbornly defended by nearby Flak positions armed with 20mm cannon, but the position was finally overwhelmed on the second day of fighting using PIAT anti-tank launchers and grenades. The Canadians fought into the city and captured the old citadel, but then were faced with the problem of clearing the numerous bunkers on the heights south of the city around Le Portel. These positions had been a constant source of fire through the fighting, with one battery of Flak guns alone having fired some 2,000 rounds in the three days



This is one of four M272 casemates of MKB Vasouy, 9./MAA.266, opposite Le Havre which was armed with a 150mm Tbts.KL/45 . (Author's collection)

of fighting. This position was finally overwhelmed but fighting for the other bunkers on the high ground continued through September 22 when the garrison finally surrendered. Canadian troops had begun to attack the bunker complexes of La Crèche but the garrison surrendered before a full-scale attack was launched.

Operation *Wellhit* led to the capture of about 10,000 German troops at a cost of about 600 Canadian casualties through the use of proven combined tank–infantry tactics that succeeded in the face of a significant number of bunkers and heavy gun emplacements. The capture of the port took six days instead of the planned two days, but the operation involved only about a third the troops used at Le Havre. The Churchill Crocodile flamethrower tanks proved to be especially useful and an after-action report recorded that most German bunkers surrendered at the first sign of a flamethrower tank. The AVRE tanks were not particularly effective as their petard launcher, although powerful, could not penetrate the 2m reinforced concrete of the bunkers, and this weapon was no more effective than any other tank gun in penetrating the embrasures and armored doors of the fortifications, if anything being shorter-ranged and less accurate. The aerial bombardment that preceded the attack was not effective in suppressing the bunkers and hindered tank operations in Boulogne due to the craters and rubble. In subsequent operations, such as Calais, the emphasis was shifted to the use of fragmentation bombs to limit the cratering. The fighting demonstrated the limitations of the Atlantic Wall fortifications since the vast majority of defenses were oriented seaward. The heavy gun casemates limited the arc of fire of the guns and, as a result, most batteries were unable to take part in the fighting. The few batteries that did have suitable orientations ,such as the dual-role Flak batteries designed for enfilade fire along the port, were responsible for the majority of Canadian casualties.

Operation *Undergo*: Festung Calais

Although consideration was given to simply bypassing Calais in favor of devoting the troop strength to the clearing of the Scheldt estuary leading to Antwerp, in late September Montgomery was convinced to deal with Calais due to the havoc that its strong gun positions could cause to Allied shipping in the Channel. On the night of September 9/10, the Regina Rifles took the fortified

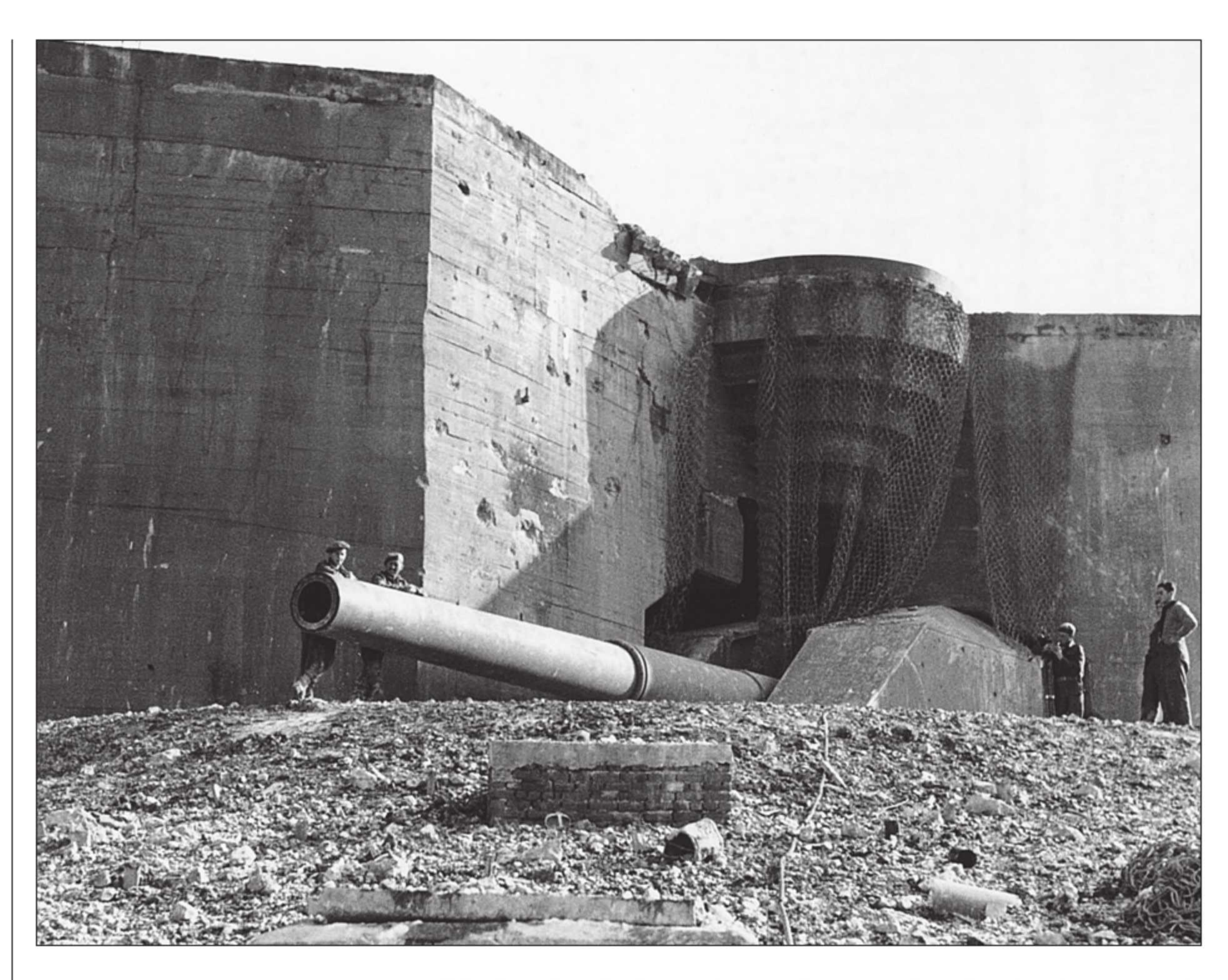
port town of Wissant and overran the bunkers on Mont Coupole, which offered excellent observation of the Cap Gris-Nez and Calais region.

Operation *Undergo* was again assigned to the Canadian 3rd Infantry Division, supported by the 6th Assault Regiment RE of the 79th Armoured Division with their specialized armor. After a series of delays, the attack began on September 25 with heavy tank and artillery support. Batterie Lindemann could offer little resistance as its guns were pointed to sea, and the garrison surrendered at noon on September 26. Within two days, the two Canadian brigades had cleared through most of the defenses to the southwest of the city, while at the same time routes of escape to the east were cut off. Once again, the old French fortifications such as Fort Lapin proved to be more formidable than the scattered German bunkers, and it was taken only after a determined Canadian infantry assault backed by Churchill Crocodile flamethrowers; the same process was repeated at Fort Nieuley. A temporary truce was called on September 29 to organize the evacuation of civilians still in the city.

The defenses south of Boulogne included MKB Pechnelke, with its four H671 casemates for Vickers 94mm Flak M39(e), of MAA.240 in outskirts of the suburb of Le Porte. These guns were captured in the 1940 battle of France and are often misidentified in historical accounts of the 1944 fighting as 88mm guns. (Author's collection)



The German headquarters for the defense of Boulogne was located on the city's southern shoulder and was based around StP 261 Pantoffelblume in Fort d'Alprech. On the southern slope of this strongpoint below the Marine Nationale signal tower was this H612 field gun casemate. This provides a good example of a common style of indented camouflage created using rolled-up paper placed in the concrete mold to break up the smooth surface. (Author's collection)



Canadian troops of the North Shore Regiment pose along the massive 406mm SKC/34 gun of Turm Cäsar in its S262 casemate, one of three belonging to the famous MKB Lindemann of 5./MAA.244, in Sangatte. This battery was submerged as part of the construction of the Channel Tunnel. The chain mail hanging over the gun embrasure was designed to protect against shell splinters and was a common feature on the larger German gun bunkers. (NAC PA-133142 Donald Grant)

While the 7th and 8th Brigades were busy in Calais, the 9th Infantry Brigade was assigned to clear the fortified belt along Cap Gris-Nez including the Batterie Todt with its four massive 380mm guns. By this stage the Canadians had a well-orchestrated scheme for dealing with the bunkers and all four of the main German batteries were overcome in a few hours fighting on September 29 and 1,500 prisoners taken at the cost of 42 casualties, with only five killed.

The evacuation of the civilians from Calais only served to further undermine morale within Festung Calais. When the truce ended on September 30, the defense simply collapsed and the garrison formally surrendered at 1900hrs. In spite of the enormous numbers of heavy gun bunkers and coastal defenses, the landward defenses were completely inadequate to hinder a determined attack, especially considering the lack of sufficient infantry in the Festung Calais garrison. The garrison did manage to thoroughly wreck the harbor, and it took more than three weeks to rehabilitate the port.

Unlike Calais and Cap Gris-Nez, Dunkirk lacked long-range gun batteries so Montgomery decided to contain the port rather than waste time and troops capturing it. The Festung Dunkirk garrison numbered about 12,000 troops. Both sides engaged in periodic artillery skirmishes, and evacuation of the civilian population occurred during a truce on October 3–6. The Czechoslovak Armoured Brigade replaced most of the Canadian troops cordoning the city after the truce. After the German garrison staged a raid on the night of October 19/20, Operation *Waddle* was conducted on October 28 to discourage further actions, the last major military action of the siege. The garrison offered to surrender on May 4, 1945, and the town was finally liberated on May 6.

Aftermath

The commander of German forces in the west in 1944, Generalfeld-marschall Gerd von Rundstedt was scathing in his later assessment: "The Atlantic Wall was an enormous bluff, less for the enemy than for the German people. Hitler never saw the Atlantic Wall, not even one part of it! He was satisfied if Organization Todt reported that so many tonnes of steel and so many cubic meters of concrete had been used." The Atlantic Wall failed to deter or seriously challenge the Allied amphibious invasion of France, and indeed, the coastal defenses in Normandy were in most cases overcome in a few hours fighting. The task of defending so long a coastline was impossible, especially given the limitations of Germany's wartime economy. The Atlantic Wall in France consumed some 17,000,000m^3 of concrete compared to about 12,000,000m^3 for the Maginot Line, and even then it never came near to the density needed to stop a determined attack. The program was symptomatic of Nazi Germany's inability to provide rational and efficient direction to its defense economy due to Hitler's amateur enthusiasms. The Wehrmacht through the war was usually short of tanks, ammunition, and other war essentials, due in no small measure to the flagrant squandering of resources on dubious schemes such as this one.

An argument can be made that the heavy fortifications along the Pas-de-Calais forced the Allies to stage their attack further away from the German frontier in Normandy, but this hardly explains the extravagant wastage of concrete and steel at so many other sites along the French coast where there was no plausible threat of Allied invasion. Furthermore, it is debatable whether the

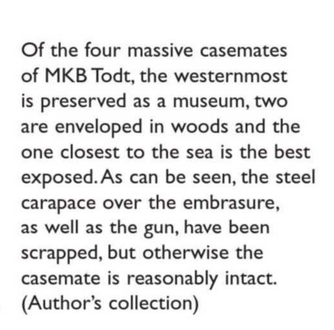
This "Café Hotel Bar" is in fact a camouflaged SK bunker for a Skoda 47mm Festungpak 36(t) and the armored ball mount for the gun is evident in the false door window. This bunker was part of the Le Havre HaK 022 strongpoint. (NARA)

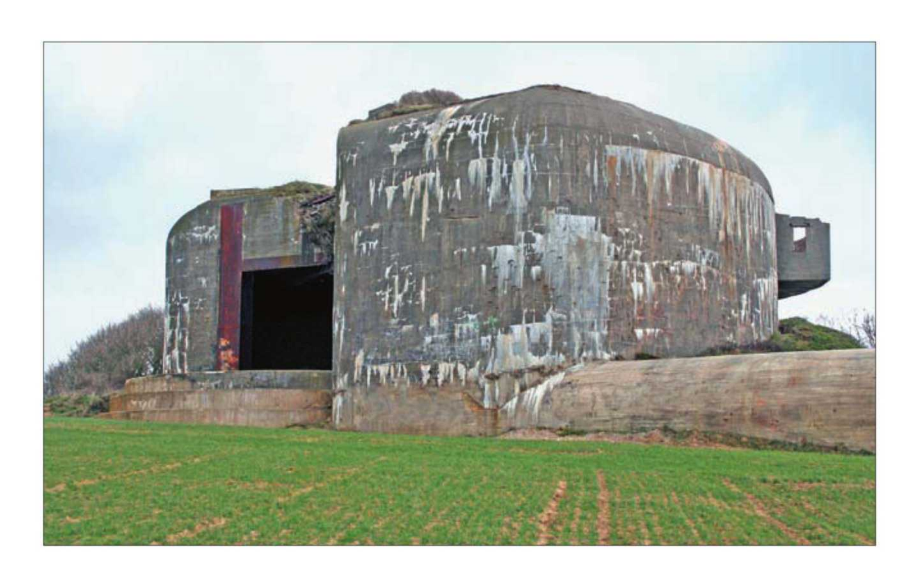


A fairly typical example of an enfilade casemate for a Skoda 47mm Festungpak 36(t), one of two located on the right flank of strongpoint WN10 to the north of Utah Beach on the Cotentin Peninsula. The metal enclosure for the ball mount is still present, though the gun itself has long since been scrapped. (Author's collection)

Allied selection of Normandy was prompted primarily by the Atlantic Wall defenses around Calais rather than the formidable concentration of German divisions, including much of the Panzer force, in this area. Indeed, it can also be argued that Normandy was a more fortuitous location for confronting the Wehrmacht in France since it extended the German logistical lines, making them more vulnerable to the ravages of Allied airpower. Given Hitler's penchant for "stand to the death" orders, the Atlantic Wall proved to be a trap for the nearly 200,000 German troops who were ordered defend the isolated *Festung* ports.

The Atlantic Wall was more firmly rooted in Hitler's romantic fervor for architectural grandeur than in German military doctrine. Coastal fortification has fallen out of favor since then, and the Atlantic Wall is likely to remain the last major example of this long European tradition.





Of the four massive casemates of MKB Todt, the westernmost is preserved as a museum, two are enveloped in woods and the one closest to the sea is the best exposed. As can be seen, the steel carapace over the embrasure, as well as the gun, have been scrapped, but otherwise the casemate is reasonably intact. (Author's collection)

The sites today

The sheer size and durability of the Atlantic Wall bunkers has made it difficult and expensive to remove them, ensuring the survival of many bunkers more than 60 years after their construction. The French government has refrained from a deliberate demolition program like the German effort to eradicate the Westwall. However, the fortifications are gradually disappearing to both man and nature. Batterie Lindemann in Sangatte is now at the bottom of an artificial pond in connection with the construction of the Channel Tunnel. Most of the remains of Batterie Friedrich August in La Trésorerie were recently demolished to make way for new industrial buildings in the town. Many more have been lost to nature than to intentional removal. A significant number of smaller bunkers located near the sea have become victim of coastal erosion, and many more have simply become heavily overgrown or completely buried over time.

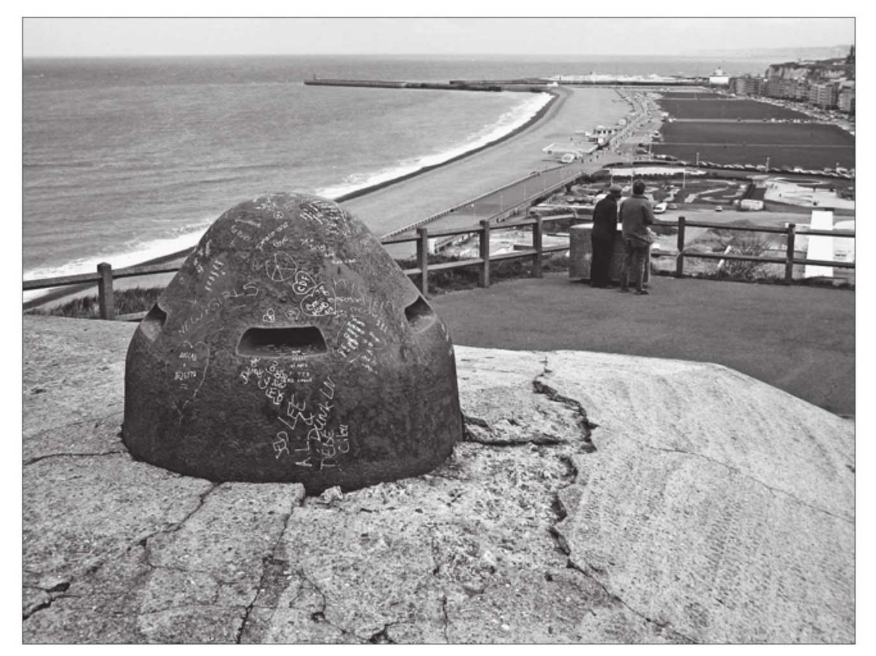
Nevertheless, there is still an ample variety of bunkers to visit. There is no handy guide to all the fortifications, though Alain Chazette's superb *Atlantikwall-Sudwall* comes the closest. Heinz Zimmermann's three-volume guide is helpful, but it is somewhat out of date. There are also several excellent Internet sites, including Bunkersite (www.bunkersite.com). While published accounts show many of the surviving bunkers, they seldom provide precise details of the location and some detailed maps are absolutely essential for visiting most sites. The best are the IGN (Institut Geographique National) 1:25,000-scale topographic maps, which in many cases provide symbols for surviving bunkers. These are only a first step to locating the bunkers, as they provide no distinction between the most

The beach south of Wissant is an elephant's graveyard of eroded bunkers, the remains of StP 120 Pommern. Coastal erosion has led to the loss or damage of many of the small infantry bunkers. Fortifications originally buried in the dunes are now isolated on the beach. In the foreground is a disintegrating H612 gun casemate, and beyond it a H630 machine-gun bunker and a pair of H600 gun platforms. (Author's collection)





On September 2, 1944, a Canadian soldier peers into a 90P9 armored cupola, part of an H608 bunker that served as the headquarters of GR.935 overlooking Dieppe from the west. (NAC PA-131232 Ken Bell)



The same scene today, which is adjacent to the parking lot of the Château de Dieppe museum. This particular bunker was built after the 1942 Dieppe raid. (Author's collection)

humble of tobruks and the most massive of gun casemates. It can take hours if not days of arduous hiking to uncover some of the sites. Besides the initial problem of simply locating the sites, access can also be a challenge. Many sites, including some of the largest bunkers, are on private land and in many cases access is discouraged. Other sites have simply become enveloped in urban sprawl around the ports. For example, Dunkirk has few of its fortifications still surviving precisely because of its prosperity since the war. Considerable care should be exercised in entering these structures as many have sub-basements that can be a trap for the unwary; in some locations local vagabonds take up residence during some months of the year.

For ease of access, the sites around the Normandy D-Day beaches are perhaps the best choice for the casual fortification buff. There are some exceptional sites



MKB St. Marcouf engaged in duels with Allied warships on D-Day and the site was heavily bombed and shelled. This massive crater in front of its observation post gives some idea of the intensity of the fire. (NARA)



A view of the observation post of MKB St. Marcouf today with the wartime damage repaired. This was an SK design peculiar to the site and not a standard design. (Author's collection)

that have been preserved such as the batteries at Longues-sur-Mer, Azeville, Crisbeq and Merville, and it is one of the few areas where a number of artillery pieces have been preserved, such as at Longues-sur-Mer. Normandy is also an excellent venue to discover the smaller tactical infantry defenses, which are better preserved here than elsewhere; I particularly recommend a walk along the beach north of Utah Beach, which has an exceptional selection of tobruks and enfilade gun bunkers. For more dedicated enthusiasts, especially those from the UK and the Low Countries, the Pas-de-Calais is a treasure trove providing some of the most spectacular bunkers such as the Todt Batterie, Oldenburg, La Crèche, and many others all within an easy drive of the Eurotunnel. I generally do my bunker hunting in the spring before the foliage reappears as it makes it easier to find smaller bunkers that have become heavily overgrown.

Further reading

The Atlantic Wall has already been the subject of several previous Osprey Fortress books: my own on the D-Day beach fortifications (Fortress 37), Charles Stephenson's on the Channel Islands (Fortress 41) and Gordon Williamson's on U-boat bunkers (Fortress 3). There is a wealth of published material on the Atlantic Wall treating the subject from a wide variety of perspectives. Alain Chazette is the premier historian of the Atlantic Wall in France and has published the definitive site survey with his superb *Atlantikwall-Südwall* as well as many smaller and more specialized accounts. Harry Lippmann is publisher of the journal *Deutsches Atlantik Wall Archiv Nachrichten* specializing in Atlantic Wall issues and his special publications provide fine encyclopedic treatment of bunker types. Rudi Rolf's multi-lingual *Typology* is the classic field guide to the standard types of bunkers. Wilt's academic study is a broad survey of the Atlantic Wall program and has been recently republished. There are numerous specialized monographs on Atlantic Wall artillery. The US Army Office of the Chief of Military History commissioned a number of specialized monographs by captured German officers in the late 1940s as part of its Foreign Military Studies (FMS) program and these provide insight into the development and intended role of the Atlantic Wall from the German perspective.

Unpublished army reports

Clearing the Channel Ports: Part V Canadian Participation in the Operations in North-West Europe 1944 Report No. 184, Historical Section, Canadian Military Headquarters

Development of the German Defence in the Dieppe Sector 1940–42 Report No. 36, Historical Section, Canadian Army Headquarters, March 1950

German Defences in the Courselles-St. Aubin Area of the Normandy Coast Report No. 41, Historical Section, Canadian Army Headquarters, July 1951

German Defence Preparations in the West Report No. 40, Historical Section, Canadian Army Headquarters, April 1951

German Permanent Fortifications US War Department Intelligence Division, 1945

German Seacoast Defenses—European Theater seven volumes, Seacoast Artillery Evaluation Board, US Forces, ETO, 1945

Report on German Concrete Fortifications Chief Engineer, HQ, US Army—ETO, 1944

US Army foreign military studies series

Dosch, Xaver, *Organization Todt: Operations in the West* B-671

Gallenkamp, C., *A Summary of the Development of Construction of the Atlantic Wall on the Bay of Biscay between the Spanish Border and the Loire* C-022

Gersdorff, Gen.Maj. von. A., *Critique of the Defense against the Invasion* A-895

Goettke, Gen.Lt. Ernst, *Preparations for the Defense of the Coast* B-663

Krancke, Adm., *Defensive Measures Against Invasion taken by Naval and Army Group HQ-West* B-169

Pemsel, Max, *Construction of the Atlantic Wall Part III: The preparations in the Invasion Area 'til the end of January 1944* B-668

Schmester, Gen.Lt. Rudolf, *Construction of the Atlantic Wall Part IV: The Effect of Bombs and Heavy Naval Guns on the Fortified Defense System of the Atlantic Wall* B-669

Speidel, Gen.Lt. Hans, *Ideas and Views of Genfldm Rommel on Defense and Operations in the West in 1944* B-720

Triepel, Gen.Maj., *Coastal Artillery Sector 1-Cotentin from 6 June until 18 June 1944* B-260

Weissmann, Gen. Eugene, *Flak in Coastal and Air Defense: the Atlantic Wall* D-179
Zimmerman, Gen.Lt. Bodo, *OB West: Atlantic Wall to Siegfried Line, Chapter 2: Preparation of Coastal Defenses Against Invasion* B-308

Published studies

Andersen, Patrick, *Le Mur de l'Atlantique en Bretagne 1944–1994* Ouest-France, 1994
Braeuer, Luc, *Forteresse Sainte-Nazaire: La marine allemande face aux Alliés* Pulnoy, 2002
Braeuer, Luc, *L'incroyable histoire de la Poche de Sainte-Nazaire* Pulnoy, 2003
Breuer, William, *Hitler's Fortress Cherbourg: The Conquest of a Bastion* Stein & Day, 1984
Chazette, Alain, et. al., *Armament & Ouvrages de Forteresse du Mur de l'Atlantique Vol. 1* Histoire et Fortifications, 2006
Chazette, Alain, *et al.*, *Atlantikwall: Le mur de l'l'Atlantique en France 1940–1944* Heimdal, 1995
Chazette, Alain, *Atlantikwall-Südwall* Histoire et Fortifications, 2004
Chazette, Alain, *Artillerie Côtière: Altantikwall et Südwall en France* Fortifications et Patrimoine, 1999
Chazette, Alain, *Les Batteries Côtières en France Vol. 1: Les batteries lourdes de Marine* Histoire et Fortifications, 2004
Chazette, Alain, *La Batterie Lindemann* Histoire et Fortifications, 2001
Chazette, Alain, *Le Mur de l'Atlantique en Normandie* Heimdal, 2000
Chazette, Alain, *Tobrouks Typologie: Atlantikwall-Südwall* Histoire et Fortifications, 2004
Delaforce, Patrick, *Smashing the Atlantic Wall: The Destruction of Hitler's Coastal Fortresses* Cassell, 2001
Desquenes, Rémy, *Le Mur de l'Atlantique de Mont-Saint Michel au Tréport* Ouest-France, 2004
Forty, George, *Fortress Europe: Hitler's Atlantic Wall* Ian Allen, 2002
Kaufmann, J. E., and H.W., *Fortress Third Reich* Da Capo, 2003
Lepage, Jean-Denis, *Les Obstacles du Mur de l'Atlantique* self-published, 1997
Lippmann, Harry, *Die Regelbauten des Heeres im Atlantikwall* DAWA, 1986
Lippmann, Harry, *Heeres-Regelbauten: Bildband* DAWA, 1995
Lippmann, Harry, *Die 5cm Kwk in Atlantikwall* DAWA, 2003
Rolf, Rudi, *Atlantic Wall Typology* Beetsterzwaag, 1988
Rolf, Rudi, *Der Atlantikwall: Perlenschnur aus Stahlbeton* AMA, 1983
Ruge, Friedrich, *Rommel in Normandy* Presido, 1979
Sakkers, Hans, *Festung St. Malo* Koudekerke, 2001
Saunders, Anthony, *Hitler's Atlantic Wall* Sutton, 2001
Schmeelke, Karl-Heinz, and Schmeelke, Michael, *Fortress Europe: the Atlantic Wall Guns* Schiffer, 1993
Schmeelke, Karl-Heinz, and Schmeelke, Michael, *Guns on the Atlantic Wall* Schiffer, 1998
Schmeelke, Michael, *Alarm Küste: Deutsche Marine-, Heeres- und Luftwaffenbatterien in der Küstenverteidigung 1939–45* Dörfler, 2005
Wilt, Alan, *The Atlantic Wall* Enigma, 2004
Zimmermann, R. Heinz, *Der Atlantikwall* three volumes; Schild, 1986



The *Michelmannstand* was a prefabricated machine-gun pit design by Festungs Pioneer Stab 27 in the Dieppe area and used by the Fifteenth Army including the Opal Coast near Boulogne. (Author's collection)

Index